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W. H. BOARDMAN, *President and Editor.*
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One of the most significant and encouraging features of the comments of railway officers on the outlook for 1910, which we published in our issue of December 31, was that a large majority of the writers testified to the growing fairness of the railway commissions. The criticism most often made was that many of the commissions are influenced more or less by political motives. The increasing fairness of the commissions is due mainly to two causes. One is that public sentiment toward railways has become much less hostile throughout the central, southern and western states during the past two years. The other is that the strong commissions—those having extensive powers of regulation—many of which have been created or completely reorganized during the past five years, are becoming experienced in the performance of their duties; and it has been almost the invariable rule that the more experience commissions or commissioners have had the fairer they have been. The new commissioner commonly goes to work with the notion that there are a great many perfectly obvious and easily curable shortcomings and abuses in railway management. He wonders that they have not been corrected, and fancies he has a full set of sure remedies. But he usually soon finds that many of what he regarded as shortcomings or abuses are irremediable incidents or even good features of the railway management; and that most of the means with which he intended to set all right are better adapted to set all wrong. Close contact with the railway business substitutes information about it for misinformation; an appreciation is acquired of the complexities and difficulties with which railway managers constantly are wrestling; and these things combined with responsibility generate conservatism. Sometimes when railway men are opposing some new and radical scheme of regulation they are reminded that their past dismal forebodings about measures which subsequently were adopted have not been realized. But one of the main reasons why the dismal forebodings in many cases have not been realized is that the measures apprehended have been invalidated by the courts or that the commissioners, who have been feared, being taught by experience, have failed, with salutary inconsistency, to live up to their advance notices.

Whether the sentiment of the public and the attitude of regulating authorities toward the railways will continue to grow more favorable will depend very largely on how frankly and fairly the railways deal with them.

Delegates representing sixty commercial and manufacturers' associations met in Chicago on January 14 and denounced the so-called "publicity" provisions of the federal corporation tax law. We hold no brief for the corporation tax law. We regard it, as it stands, as an unwise measure. But we cannot refrain from remarking that the meeting in Chicago referred to calls attention anew to the old and familiar circumstance that it makes a deal of difference whose ox is gored. The associations which sent representatives to this meeting have all been very active for years in agitating for a wide variety of legislation to give publicity to, and to subject to drastic regulation, every detail of the railway business. When railway managers have opposed such legislation these associations have denounced them. When the publicity given to railway affairs has disclosed conditions that were not just what they ought to be—or what the professional critics of railways thought they ought to be—these associations have denounced the railways' managers some more and demanded additional regulatory legislation. The law makes the published rate the only legal rate; railway men, being human, sometimes mistakenly quote the wrong rate; and therefore these associations set up a loud outcry and demand that the misquotation of rates shall be made a criminal offense. They applauded when Congress opened railway books to the Interstate Commerce Commission and the commission prescribed a uniform method for keeping them. They applaud when it is proposed to put the financial and operating department as well as the traffic department of railways under the detailed supervision, regulation and control of the Interstate Commerce Commission. But open the books of manufacturing or mercantile corporations to the prying eyes of public officials? Spread their sacred contents before the bawling mob? Merciful Heavens! Commercial associations "turn thought sick at the act." It is an offense to think of it; an outrage to suggest it, and to do it—that would be a most fell and heinous crime, indeed! It is all right to regulate the railways. They are public service corporations; and any concern that has the folly, impudence and turpitude to engage in the business of serving the public deserves all the kicks and contumely that private corporations, which do not serve the public, but merely serve themselves, may demand shall be inflicted. But to disclose what profits private corporations are making and how they are making them—to publish to the world how much they are over-capitalized—to gather from their books, perchance, some significant data touching the reasons for the increases in the cost of living—why, that would be an interference with private enterprise that would destroy our free institutions and establish socialism, bureaucracy or something equally evil. Too bad; isn't it? But then, as we already remarked, it always did make a lot of difference whose ox was gored.

AN INTERNATIONAL CONTRAST.

Just at present our English kindred across the sea are in one of the fiercest political conflicts of their national history. Its issues are several, with sharp cleavages not only between but from the old Liberal and Conservative parties. The leading question may perhaps be described as political and resting on the status and legislative prerogative of the House of Lords. But even that issue springs from an economic condition interpreted in the famous Lloyd-George budget, with sub-branches reaching out into forms of taxation—tariff, excise, land "unearned increment" and the rest. But what, in the great battle of the British electorate, ought to catch the American eye is the complete absence of the "corporation" issue. No anti-trust cry is heard amid the numberless British shouts from the stump or is even suggested by the party cartoons. Railway rates, railway control, regulation, powers of commissions over transportation, "high finance" cut no figure in the great contest. And this exclusion of corporate and railway questions from an intense popular canvass is found in a land of cognate race with our own, with a likeness in its legitimate business methods and where the railways, gridironing a country of dense population, stand to the people in the closest relation of convenience and necessity. And a country, moreover, from which our own fundamental railway statutes have been drawn.

Let us fancy, for a moment, such a great national contest as that in the United Kingdom with economic questions foremost shifted at this time to our own land. Conjoined probably with the tariff issue and intimately woven with it would be the anti-corporation hunt in full cry. We should be hearing from the stump the anathemas leveled at Wall street, the plea for sharper railway regulation, loud declamation on rates, on federal control, on powers of the Interstate Commerce Commission. The "big stick" wielded not long ago at one end of Pennsylvania avenue would be subdivided into hundreds of minor oratorical clubs of the partisan campaigners. Organized railway labor would be actively in the field with its demand for higher wages and probably both parties catering to it—until after election. There would be chills and fevers of railway values, uncertainties in the horoscope of vested interests and prophecies of gloom until the campaign froth settled down into post-election calm, when the triumphant party would face the serious condition of administrative responsibility. The same post-election responsibility, in general character, will be fronted in the mother land whether Liberal or Conservative wins—but with corporate and railway legislative problems left out. As tested by the pending battle at the polls it would seem as though the United Kingdom had worked out her railway law-making to the point at least of popular contentment and where, in our American vulgate, the "stand-pat" policy prevails.

In a broad way this contrast of the two countries teaches us some vital lessons. One, and, perhaps, the most important, is the value of homogeneity in railway law-making. Let me suppose that each county in England had certain extensive powers over railways; that each county had also its own railway commission with functions shifting from year to year; and that by parliamentary decree those powers were constantly jostled by a national railway commission. How long under such complexities would it take to solve transportation problems and would they ever be solved? Yet such, in substance, is the American status to-day with no two states homogeneous in railway law and some states—like Massachusetts and Connecticut—in conflict over the scope of railway charters. And meanwhile the line of demarcation between state and federal power remains vague and undefined and federal authority constantly tinkering with the functions of its own commission. The United Kingdom has had, necessarily, such a centralized commission. But our kin-beyond-sea have relatively had fixity of law and been spared the clashes and complications of the divergent statutes of heterogeneous states. Such a contrast between the two countries was undoubtedly to some extent to be looked for owing to their differences geographical and governmental. But the force of the British example and precedent remains in favor of fixity of law and the harmonies of state law-making.

Historically viewed the United Kingdom has passed in its railway policy through economic situations familiar to us in the United States. There was the "let alone" policy of the second quarter of the last century, based upon the theory of competition of many lines. Next the period of rapid British railway consolidation. Next a period of restrictive law-making, with enforcement left to the courts. And, finally, the commission plan of regulation adopted in 1854, with powers enlarged in 1888 but under supervision of the Board of Trade. In a general way it has been for several decades in the British isles as it would be in the United States were the Interstate Commerce Commission in substantial control of railway traffic with privilege of the companies to appeal to the courts and with no distinction between interstate and intrastate business—the commission thus dropping its interstate character as well as title. But in the British outworking of the relation of the state to the railways there have been other easements than rational unity as distinguished from a federation of states each with its separate body of railway law. There has been the stronger popular respect for the vested right; the exemption of the railway problem from politics, from the spoilsmen, from the legislative "strike"; more powerful forces of publicity, acuter interest and more vigorous action of shareholders; and, lastly but not least, railway questions addressed to the minds of trained men in official authority unswerved by popular spasm or legislative whim. The mother country, in brief, has clarified, if not solved, her problems of railway and state in a spirit of scientific conservatism.

Hence it comes to pass that in our own land at a time of electoral peace the executive and Congress must wrestle with a complexity of railway subjects which reach endlessly into the mists of the future; while, *per contra*, a great economic contest to be fought out at the polls in the British isles is joined without visible trace of the anti-corporation motive or impulse. The striking contrast should not be lost to view as a guide for the American citizen in the directions—harmony of law, official intelligence, conservative action and publicity—in which our national emergence from the maze of railway polity lies.

REGULATION OF THE ISSUANCE AND OWNERSHIP OF RAILWAY SECURITIES.

One of the most important parts of President Taft's recent message regarding regulation of railways and trusts is that relating to federal control of the ownership and issuance of railway securities. If we correctly understand him his principal recommendations are as follows: (1) That railways shall not be disturbed in the possession of stock that they already own in competing roads, and shall be permitted to get complete control of competing roads of which they now have majority control. (2) That every road shall be prohibited from acquiring in future any interest in any competing road in which it has no interest now. (3) That railways shall be prohibited from issuing stock or bonds for less than their par value *in cash*, excepting (4) that they may be issued for less than their par value with the consent of the Interstate Commerce Commission, but not at less than their market value as ascertained by the commission. (5) That it shall be provided that on the reorganization of any railway, after sale at foreclosure or other legal proceedings, it shall not be allowed to be capitalized in excess of the fair value of its property, as ascertained by the commission.

These recommendations are divisible into two classes: (1) those that relate to the common control of the competing lines,

and (2) those that relate to the issuance of the securities.

As to the desirability and practicability of maintaining railway competition there are conflicting opinions. Some regard railways as much like most other industries, and think that the same attempts should be made to prevent the suppression of competition between them as between industrial concerns. Others regard railways as natural monopolies, like waterworks or lighting companies, and think that they should be encouraged to combine, and that the public should rely for protection against excessive and discriminatory rates and bad service entirely on public regulation. These theories are incompatible. Yet the state and national governments have acted on the assumption that both are right; and Mr. Taft favors continuing to do so. On the theory that railway rates and service should be regulated by enforced competition, the Interstate Commerce act prohibits pooling, the Sherman Anti-trust act, as construed by the federal courts, prohibits agreements regarding rates and consolidations of parallel lines, and numerous state laws impose similar restrictions. On the theory that railways are natural monopolies, the nation and the states have passed laws and created commissions to regulate their service and control their charges. Mr. Taft in one part of his message favors allowing competing railways to enter into agreements regarding rates; in another, favors letting existing railway combinations alone; in another, favors legislation to prevent further consolidations; and in still another, favors increasing the control of the Interstate Commerce Commission over rates.

If we are to work out a consistent and beneficial policy of regulation we must recognize the fact that both of the theories referred to cannot be right—that, in fact, in their extreme forms, both are wrong. Each railway is, in a sense, a monopoly at points on its line reached by no other road. A combination of railways is, in a sense, a monopoly in a territory penetrated only by the combined roads. But in another sense no railway or combination of railways is a monopoly. People are prone to think that only parallel lines compete. But competition often is fiercer between roads that reach the same producing, distributing or consuming centers from different or opposite directions than between parallel lines. One of the worst rate wars in the history of this country was waged for the grain traffic of the trans-Missouri country by the lines leading from that section to the gulf of Mexico and the lines leading from there to the Atlantic seaboard. A rate war is being waged now by the roads that haul sugar and coffee to Chicago from New York and those that haul these commodities from New Orleans. Even if all the roads of the country were under one control there would be a modified form of competition. For doubtless the roads would have different traffic managers, each of whom would want to make a good record. To do this he would strive to give such service and rates as would develop the maximum traffic; and in doing this he would be struggling constantly to keep the territory his road served on at least a parity of rates and service with territories served by other roads.

Experience has shown that the nature of railway competition is such that when unrestricted it is sure to be carried to an extreme that exhausts the combatants and causes unfair discriminations between shippers and communities. To stop its being carried to this pernicious extreme the railways early formed pools and later traffic associations, and still later resorted to "community of interest" arrangements and consolidations. Each of these steps was followed by legislation or decrees of the courts to compel a renewal of the cut-throat warfare. These forms of governmental interference have been harmful when they have not been futile, and futile when they have not been harmful. They often have prevented natural and salutary agreements and caused unnatural and illegal combinations.

It would seem, therefore, that experience and reason unite to demand that the government shall entirely abandon attempts to prevent not only railway agreements but also railway combinations. It is very probable that this would not increase the tendency toward combination; and the interest which each road or combination of roads has in developing the territory it serves may usually be much more safely relied on than any statute or public authority for protection against bad service and excessive or unfair rates. Surely, unless the public's confidence in railway commissions is misplaced, they can be relied on for such further protection as its interests require.

(2) The worst abuses in the railway business of this country are found in the administration of the financial affairs of some roads. These abuses are not so prevalent as they were some years ago; but there still are a good many railway directors and managers who have not learned, or who still deliberately violate, their duty to their stockholders, their bondholders and the public. The railway manager and director are trustees in one sense or another for each of the classes named. It is the duty of each to operate railway properties in every particular with an eye to the interests of each of these classes.

When a railway director or manager profitably speculates—we say "speculates," not "invests"—in the stock of his own company, from whence do his profits come? From the pockets of his stockholders, unless his operations are pure gambling; and as it is his duty to use his official position and his knowledge of his company's affairs to make profits *for* his stockholders, not *from* them, his act not only legally is a violation of his trusteeship, but morally is as indefensible as it would be for him to appropriate cash from his company's treasury. It is only too notorious that there are managers and directors who do thus make profit at the expense of their stockholders.

It is often necessary, especially in the case of a new or unprosperous road, to issue securities exceeding in aggregate *par* value the present value of the road. Over-capitalization in any other case does no good and usually does harm. Contrary to the popular belief, it has no effect on rates. But it does often result in loss to innocent investors. It sometimes results, also in the payment in interest or dividends of earnings that should be spent in the maintenance of the property, and in consequent deterioration of the service rendered to the public. Worse yet, it damages the credit of the road, and sometimes closes the money markets of the world to it. While the railways of the United States as a whole are not over-capitalized, there have been not a few cases of gross and entirely unnecessary watering of the stock of railways, even in recent years.

These kinds of misconduct by railway managers and directors have provoked the loud and widespread complaints about the financial management of our railways, and the demands, such as are voiced by President Taft in his message, for public regulation of the issue of securities. The recent disgraceful manipulations of the stock of the Rock Island are good examples of the sort of thing that has exasperated public sentiment. But the adoption of Mr. Taft's recommendations would not prevent those "melon-cuttings" which are accomplished by the sale for par of stocks of a market value more than par, and which are, justly or not, much complained of; in fact, it would have little or no effect on roads whose securities uniformly sell above par. It would not prevent the payment of unearned interest or dividends. It would not prevent managers and directors from speculating in their company's securities, or even with their company's money. It would not cause, or tend to cause, all the money raised by the sale of securities to be honestly and economically spent—as all money thus raised ought to be spent—in extensions of or permanent improvements in the property. Its effects on roads the market value of whose securities is less than par would probably be similar to those produced by a law of Massachusetts which was in effect from 1893 to 1908. This law prohibited railway securities from being sold below par; if they were sold above par it must be for their market value as fixed by the state railway commission. Often after the price was fixed by the

commission the securities declined in the market and they became unsalable. Result: the two principal railways in the state could get no money to make improvements with. The law was doing far more harm than good, and in 1908 it was amended to permit securities to be sold at a price fixed by the stockholders.

Mr. Taft's recommendations do not seem adapted to reach and suppress the real evils in railway financial management. The great desideratum to be aimed at is to influence, and if necessary, to force, railway directors to perform their legal and moral duties. But this force cannot be applied by law. It was observed many years ago that a stern chase is always a long chase, and if directors are minded to wickedness they are sure to be fully as clever as the lawmakers, and, in point of time, to be from six months to four years ahead of them. A defective sense of trusteeship is a thing that cannot be legislated out of existence any more than Tammany Hall can; the only cure for it is public sentiment, kept aroused by the forces of enlightened selfishness. Both the railways and the great municipalities in this country are administered far more honorably than they were a generation ago, and the railway management is, and always has been, tremendously better than the municipal management. Yet city government is hedged about with a mass of legislation, and is placed directly in the hands of the voters for revision every election day. If every detail of railway management were governed by law, and the officers chosen at the polls by the throngs in State street and Broadway, does anybody suppose that the traveling public would be served better or more cheaply than it is at present?

REPORT OF THE NEW YORK PUBLIC SERVICE COMMISSION, FIRST DISTRICT (NEW YORK CITY).

The New York Public Service Commission, First district, which has jurisdiction over the steam and electric railways operating in New York city, in its report for 1909 lays before the legislature its grievances. It says that through the interpretation of the courts, the Public Service Commission law has been so modified as to take away power from the commission which is essential to its efficient control of public service corporations. The courts have held in overruling the first district commission that if it is shown that public convenience and necessity require a franchise to be given to a corporation, the commission's consent cannot be withheld because the commissioners have ideas of their own as to what terms the franchise should provide.

Another grievance of the commission is that the state supreme court, in overruling the Second district commission in its refusal to grant permission to a railway company to issue bonds, held that as the statute specifically states for what purpose bonds and stocks may be issued, it is not left to the judgment of the commission to refuse its approval except in so far as the security issue may run counter to the provisions of the statute. The courts have determined, the report says, "that the words used in the section relating to this subject [the issue of securities] only require the commission to determine whether stocks and bonds sought to be issued come within one of the four purposes stated in the section, i. e., the acquisition of property, construction of its facilities, improvement and maintenance of its service, or the discharge or refunding of its obligations. The result is that this construction of the words used in the act deprives the commission of power to stop stock-watering, for it is easy for the companies to bring within the four legal purposes sums that never should be capitalized, as, for instance, expenses of operation, taxes, replacement or even dividends." Such reasoning is absurd. Even the most superficial reading of the case in which the Second district commission was overruled shows clearly that the court would not for a moment tolerate the issue of securities for any such purposes as are mentioned by the commission. The sum and substance of the supreme court's ruling was that where the issue of securities was clearly legal, the commissioners could not substitute their judgment for that of the owners of the property as to the wisdom of the details of such issue of securities.

Besides the two grievances mentioned the commission recommends that the railway law be so changed as to facilitate the abolition of grade crossings. As the law stands it is difficult for the commission to prescribe any general plan of elimination of grade crossings, as it can only prescribe in specific cases the method of elimination of the crossing. This is a fair criticism of the law, and if the commission could be trusted to order elimination of crossings in a reasonable way, which is doubtful, it would be a wise thing to enlarge its powers in this respect. The commission complains that its power to fix rates is seriously diminished through the action of the courts in reviewing the facts in the case of a rate reduction. The commission claims that its orders should be treated in the same way that an act of the legislature would be treated, that is, be considered binding unless unconstitutional. In theory the United States supreme court takes this attitude toward the Interstate Commerce Commission; in practice the United States courts have been inquiring into the facts as presented to the commission, and have themselves determined whether a rate prescribed by the commission is reasonable or unreasonable, irrespective of its constitutionality.

During the year the New York Public Service Commission, First district, held 111 meetings for formal consideration of matters and considered 271 formal cases, of which 57 were undecided at the end of the year. Of the total 271 cases, 113 were on motion of the commission itself. The most important case dealing with the issue of new securities was the request of the reorganization committee of the Third Avenue to issue $68,516,800 new securities. The commission decided that there was no evidence of the Third Avenue property's capacity to earn interest on this amount of capital, and the reorganization plan was refused the approval of the commission. Since this refusal another plan providing for $54,916,000 securities has been submitted but not passed on.

A good deal of time last year was devoted by the commission to the investigation of fenders and safety appliances for surface cars. The total number of accidents on street, elevated and subways and steam railways within New York city was 56,481 in 1908 and 52,618 in 1909; the number of persons killed in 1908 was 444 and in 1909, 325.

The magnitude of the problem of carrying passengers in New York city during rush hours has been dwelt on in previous reports of the commission. The fact of the matter is that just as soon as any more facilities are added for handling passengers, traffic is at once so greatly increased that it more than taxes the new service to the utmost. In each 24-hour period in New York passengers equal in number to about 85 per cent. of the entire population must be carried. One-third of the entire traffic comes in one-twelfth of the time. The rapidity with which traffic takes advantage of added facilities is well shown in the following table, giving the number of passengers to and from Long Island:

Routes	1907.	1908.	1909.
Brooklyn bridge	423,000	309,783	323,006
Williamsburg bridge	163,000	163,233	206,606
Queensboro bridge (Blackwell's Island)	Not open for traffic.	Not open for traffic.	26,300
Ferries	120,000	175,749	120,841
Interborough subway	Not open for traffic	159,708	193,784
Total	706,000	827,473	870,537

The returns of street railways and the Staten Island Rapid Transit, which is a steam road, show that in 1909 the car mileage for all companies in New York city totaled 272,369,956. The revenue per car mile was 26.8 cents, expenses 16.0 cents, leaving net revenue of 10.8 cents.

It is expected that early in the present year it will be

possible to open bids for about 38 miles of additional subways, of which 23 are to be in Manhattan and the Bronx, running north and south; one mile of crosstown road in Manhattan, five in Brooklyn; and nine miles extension of the Brooklyn subway to Coney Island. The number of miles of subway now operated by the Interborough Rapid Transit is 25.82.

The commission has made persistent efforts to increase the facilities and service in the present subway, and an order directing the adoption and operation of side-door cars on express trains has already added considerable to the capacity of the subway and has very much improved the service. The efforts of the commission were resisted by the Interborough Rapid Transit and as yet less than half the subway expresses during rush hours are made up of side-door cars. There seems to be, however, no doubt that in this case the commission was right and the Interborough people wrong.

REPORT OF THE NEW YORK UP-STATE PUBLIC SERVICE COMMISSION.

The New York Public Service Commission, Second district, has been making during the past year consistent efforts to reduce the number of formal orders issued and to handle as great a number of complaints by informal proceedings as possible. The commission in its report to the legislature for 1909 says that "where authority to effectively correct abuses is fully conferred by the statute, the changes of rates and provision of better service called for by well-founded complaints can generally be secured by the commission without trial and issuance of orders." This is a tribute both to the spirit in which railways and other corporations under the jurisdiction of the up-state commission are meeting state regulation, and also a tribute to the skill of the commission itself. The confidence in its fairness and disinterestedness which the up-state commission has inspired in railways is in pleasing contrast to the suspicion of ulterior motive or bias which attaches to the orders of so many of the other state commissions.

A good instance of the attitude of the commission is afforded by its comments on the reluctance on the part of certain shippers to bring complaints for fear such action may prejudice them in the minds of railway managers. The commission says: "Of course such fear is entirely unfounded and not likely to exist to any extent after shippers have come thoroughly to realize that common carriers in this state (New York) are required by law to act and conduct their business in conformity with accepted standards of reason and justice." In cases where subordinate railway officers have represented to shippers that the railways could not allow claims because of fear of reprimand by the commission, the commission has done all in its power to correct this impression, and the higher railway officers have denied any responsibility for such statements.

The commission finds, from actual investigation of freight and passenger tariffs, that the trend of rates and fares in the state has been downward.

Of the passenger tariffs changed, 65 per cent. showed reductions. The improvement most noted in tariff construction is in the consolidation of rates applying to the same commodity, into one schedule, the elimination of duplicate tariffs and the arrangement of these tariffs in a plain and concise manner. The efforts of the commission are being directed toward this simplification in the belief that it will greatly reduce the number of complaints from shippers who have had rates misquoted to them by agents of railways.

The supervision of the commission over the financial affairs of railways is described in the report as having extended over companies operating a steam railway mileage of 8,164 miles. The following table shows the aggregate results of operation of these steam railways:

	1907.	1908.	1909.
Gross earnings, operation.	$396,557,982	$402,317,818	$402,265,445
Increase over 1908, pr ct..	8.16	1.45	*0.01
Expenses of operation....	$278,191,841	$282,410,002	$266,852,915
Inc. over preced'g yr., pr ct	10.06	1.51	*5.51
Net earnings, operation...	$118,366,141	$119,907,816	$135,412,530
Inc. over preced'g yr., pr ct.	3.88	1.30	12.93
Tons freight carried.....	265,609,000	248,750,953	247,652,000
Inc. over preced'g yr., pr ct.	6.69	*6.34	*0.44
Ton-miles, freight carried.	37,343,086,000	37,564,347,398	37,530,589,000
Inc. over preced'g yr., pr ct.	9.26	0.59	*0.69
Passengers carried	253,693,000	273,880,817	274,741,000
Inc. over preced'g yr., pr ct.	2.68	9.93	*1.48
Total passenger-miles....	6,010,356,000	6,511,203,679	6,460,505,000
Inc. over preced'g yr., pr ct.	7.59	8.33	*0.80
Total divs. paid during yr	$52,107,722	$42,159,002	$39,215,300

* Decrease.

While the gross earnings of the roads in the fiscal year ended June 30, 1909, was only one-one-hundredth of 1 per cent. less than in 1908, the dividends paid to stockholders in the 1909 fiscal year are less by $2,943,702, or 7 per cent., than those paid in 1908.

The gross earnings of electric railways were $21,194,486 in 1908 and $21,919,652 in 1909. Net earnings were $7,065,336 in 1908 and $7,272,253 in 1909. The total dividends paid were $2,065,242 in 1908 and $2,965,206 in 1909. The commission gives the following very interesting table, taken from the statement of the total 310 corporations under its jurisdiction operating electric railways and electric lighting and gas plants:

Amount of common stock paying no dividend.....	$126,956,530
" " common stock paying dividend.....	53,859,074
" " preferred stock paying no dividend	15,817,400
" " preferred stock paying dividend.....	18,461,072

The commission draws the inevitable conclusion that either large sums of the stock outstanding of these corporations represent no actual cash investment whatsoever and should therefore have never been issued, or else there is something radically wrong with the conditions under which such corporations operate, which prevents public service corporations in New York from earning returns on such enormous sums of money invested in them.

During the year the commission granted authority for the issue of $142,855,035 stock, bonds and other indebtedness. The increase in the amount of capitalization authorized in 1909 over 1908 is 56.6 per cent.

In its supervision over the physical operation of railways the commission has been somewhat hampered by the fact that the act creating the commission does not specifically state whether the commissioner should pay the traveling expenses of inspectors or whether this transportation should be furnished free by the railways. A rather funny case came up last year in connection with the inspection of the Delaware & Hudson. The commission had decided to pay the regular fare for its inspectors. The D. & H. presented a bill to the commission for $2,450 for the use of an observation engine employed in the inspection trip in 1908. The commission had not paid this bill last year, and the D. & H. refused to furnish an observation engine until the bill was paid. The commission, therefore, did not make an inspection last year of the D. & H., although it did of all other roads. It is suggested that the legislature pass a specific law requiring the railways to carry free inspectors when engaged in their duties.

Another recommendation of the commission is that more money be appropriated for the elimination of grade crossings. Only one-quarter of the expense of this work is being borne by the state. Last year no appropriation was made, and the commission spent the remainder of what money was available. In all there has been spent by the state for its one-quarter share of the work $1,617,607 for elimination of grade crossings contracted for or now under construction.

The inspection of equipment on small roads showed serious defects in some cases in the safety appliances, air-brakes and tender wheels. There were 2,575 rail breakages in the ten months of 1909. and in January, February and March, 1909, there were 1,280 breakages as against 3,408 in the corresponding months of 1908. In 1908 there were eight persons killed

and 22 injured by locomotive boiler explosions and other boiler accidents, while in 1909 there were six killed and seven injured. The commission supervises the inspection of one-seventh of the total locomotive boilers in the United States. In every case of a fatal accident investigation showed the cause to be low water. The commission believes that the low water accidents have been reduced by the improvement in the inspection of water glasses, gage cocks and injectors, but it does not favor the appointment by the government of detailed boiler inspectors to duplicate or supersede the inspection work now carried on by the railways, because it believes that the railways themselves should take this responsibility.

The New York Central & Hudson River has asked the commission to change its order directing the complete installation of oil-burning locomotives on the Adirondack lines by April 15, 1910. The Central says that the improvements applied to ash pans, spark arresters, etc., on coal-burning locomotives have been so successful that it is not necessary to adopt the more expensive method of equipping oil-burning locomotives. The Delaware & Hudson, the other road operating through the Adirondacks, has made no objection to the commission's order.

One recommendation of the commission is so sure to meet the hearty support of country newspapers as a whole that it is not entirely above suspicion. The commission recommends that the legislature pass an act requiring railways to publish their time-tables in local papers. The convenience to the public of having these time-tables published in local papers has something to recommend it, but the policy of interfering in a matter so entirely within the jurisdiction of the railway management itself is certainly questionable, and the recommendation of the commission appears to be a bid for support from country papers.

NEW BOOKS.

Electric-Power Conductors. By Wm. A. Del Mar. New York: D. Van Nostrand Co. 339 pages; 7 in. by 5 in.; 69 illustrations. Cloth. Price, $2.00.

This book is handy for a busy engineer to have at his elbow. It will be of value not only to the electrical engineer who is called upon to make close calculations as to cost and constructions, but also to the general engineer who may often wish to reach an approximate result quickly when there is not time to consult a specialist in the matter. It contains a series of tables and formulas adapted to the solution of questions relating to the subject of which the book treats. It is a handbook, that takes up the materials that are used for conductors, and the gages and dimensions in accordance with which they are supplied. There are also brief statements of the electrical properties of these materials. In the fourth chapter, the methods to be employed in the determination of the sizes to be used for a given voltage and drop are treated. This is combined with calculations on the stresses that will be encountered in given spans, and is followed by a chapter on the testing of wires and cables. There are also copies of standard specifications with instruction for the installation of underground and overhead lines, together with information about third rail circuits and rail bonding.

Alternating-Current Motors. By A. S. McAllister. New York: McGraw-Hill Book Co. 322 pages; 6 in. by 9 in.; 138 illustrations. Cloth. Price, $3.00.

This book is not prepared for the student; it presumes a considerable knowledge of electro-magnetic phenomena. For a person not so equipped, it would be quite unintelligible, but if this training has been acquired the author's arrangement and presentation of the subject will be found to be clear and interesting. The book is remarkably free from mathematical formulas, and when these are used they are those of the simpler branches and therefore readily understood. In fact, the major portion of the volume has already appeared as articles in technical papers. It must not be inferred from this, however, that the whole treatment of the subject is a simple one, for that is not the case. A general outline of the contents shows that, starting in with single-phase and polyphase motor circuits, the work covers an outline of induction motor phenomena and performance as well as their use as frequency converters. The methods of applying the graphical treatment to induction motors is discussed, as well the use of these motors as asynchronous generators and transformers, together with their magnetic field. Motors of the repulsion and series types are treated both graphically and algebraically, the closing chapters being on the methods of preventing sparking in single-phase commutator motors and the leakage reactance of induction motors.

Six-Language Technical Dictionaries. Volume 5, covering railway construction and operation. Illustrated; 870 pages. Cloth. $4. Volume 6, covering rolling stock. 796 pages. Cloth. $3. Prepared by K. Deinhardt and A. Schlomann. Published by the McGraw-Hill Book Co., 239 West 39th street, New York.

Two additional volumes of this extraordinary six-language series of illustrated technical dictionaries are now at hand. The other volumes in the series deal with machine details and tools; with electrical engineering; with boilers, steam engines and turbines, and with internal combustion engines. No work comparable with this has ever before been done in making combination-language technical dictionaries. To clarify the meaning of expressions which might otherwise be obscure, each object described is illustrated with a small cut in the center of the page. Around this cut are grouped the words or phrases describing this article, in English, German, French, Italian, Spanish and Russian. Processes are also described, as, for example, "expanding the tube end" or "irregular combustion." Of course, these processes cannot always be illustrated, but wherever illustration is possible it has been attempted. Each book is classified with great care as an additional aid to locating words and phrases, and at the back of each book there is an elaborate index in each of the six languages.

The compilers and the publishers of these excellent books deserve the highest praise for their work, which must have been, at least in the case of the compilers, exceedingly toilsome. We should imagine that these dictionaries will stand as the standard international reference work on technical terms in the engineering field for a great many years.

Contributed Papers.

ROBERTS WALKER.

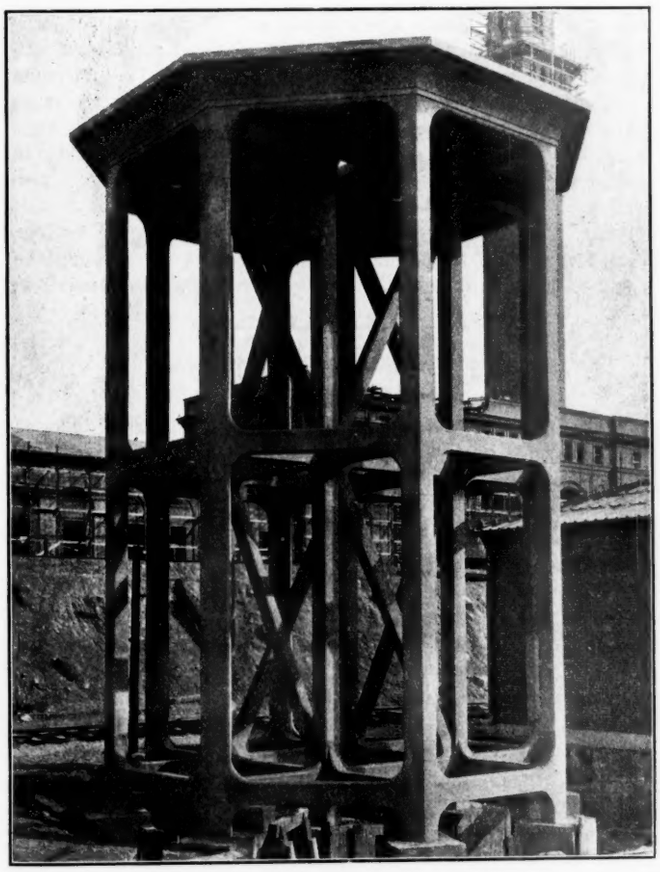
Roberts Walker has been elected general counsel and chairman of the executive committee of the Chicago, Rock Island & Pacific Railway and president of the Rock Island Company. He succeeds Richard A. Jackson as president of the Rock Island Company and D. G. Reid as chairman of the executive committee of the Chicago, Rock Island & Pacific. Mr. Walker entered the service of the Rock Island in 1904 as assistant to Robert Mather, who was then general counsel. He was born in Rutland, Vt., August 24, 1874. His father, Major Aldace Walker, was one of the receivers of the Atchison, Topeka & Santa Fe, taking the place of Mr. Reinhart, who resigned in 1894. On the reorganization of the Atchison in 1895 Major Walker was elected chairman of the board of directors, holding this position until the time of his death in 1901. Roberts Walker went to Amherst College, receiving the degree of A.B. in 1896. He received the degree of LL.B. from the Columbia Law School in 1899 and at the same time received the degree of A.M. from Columbia University. After leaving college he entered the law office of Guthrie, Cravath & Henderson, now Cravath, Henderson & de Gersdorff. While at college, and at the law school, Mr. Walker was naturally in very close touch with railway affairs, especially in the Southwest, because of the work which his father was doing there.

His work, after he joined the Rock Island as assistant to Robert Mather, became more and more of an executive character. He was a first-class assistant, but he had as well initiative and capacity to assume responsibility. He has the rather unusual combination of methodical and hard-working methods and very quick perception and decision.

It is seldom, indeed, that a man as young as Mr. Walker—he is not yet 36—is entrusted with the presidency of a large company and the chairmanship of the executive committee of a railway of 8,000 miles. The resignation of Richard A. Jackson as president of the Rock Island Company and as general counsel of the railway company was apparently very suddenly decided on, and the same is true of the resignation of D. G. Reid as chairman of the executive committee of the railway. Mr. Walker was the man most familiar with the affairs of the Rock Island Company, with the duties of the general counsel of the railway company, and with the general supervision of legal interests of the Rock Island group, and when a sudden emergency arose he was the man selected to fill the gap.

CONCRETE FOUNDATION FOR WATER TANK.

The accompanying photograph shows the concrete foundation for a water tank of the New York, New Haven & Hartford at Waterbury, Conn. A similar foundation has been built for a tank at Naugatuck. The structure is particularly interesting because the reinforcement consists of third rails. These rails were originally used on the Bristol line of the New Haven, but public sentiment against the third rail resulted in action by the Connecticut legislature, and the company some time ago had to install an overhead trolley wire instead. The third rails were taken up, but because of their peculiar section they were useless anywhere else. However, it was found that two of them combined make an excellent column section for a structure of this kind.



Concrete Foundation for Water Tank.

THE WESTERN RAILROAD ASSOCIATION.*

The Western Railroad Association comprises practically all of the large western, southwestern and northwestern railways, the New York Central Lines having their terminals in Chicago, the Erie, the Bessemer & Lake Erie, the Hocking Valley, the Grand Trunk, and the Nashville, Chattanooga & St. Louis. The affairs of the Association are governed by a Board of Directors, an Executive Committee, a President, a General Counsel and Treasurer, and a Secretary. Most of the business is handled by the General Counsel. The expenses, which average about $29,000 a year, are divided among the members in proportion to their gross earnings.

In return for the assessment the Association defends all patent, trade-mark or copyright suits that may be brought against its members; conducts negotiations involved in the settlement of claims; sends out monthly lists of expired patents; passes upon licenses, assignments and other papers, and generally, renders such assistance as it can within its sphere. The Association tends to discourage frivolous lawsuits. Any member is entitled, without any payment beyond its regular assessment, to opinions upon all matters pertaining to patents, trade-marks or copyrights in which it may be interested. * * * While fairly familiar with mechanical drawings by reason of a technical education and 16 years' experience in this office, I often find that a drawing, clear to the man who sends it, is not clear to me because I have never seen the device. Hence the necessity for a description, which should not only include the apparently important points, but the minor points as well. At this day, when nearly a million patents have been issued, one rarely comes out involving a fundamental principle; they are mostly on minor improvements, and therefore the minor details of a device should be particularly described, because more likely to involve infringement.

* * * Some years ago I passed upon a car coupler, advising that it could be safely used. Suit was afterwards begun, but not brought to my notice, resulting in a decision in favor of the patent and against the coupler. I failed to understand how I could be wrong until I discovered that the road was not using the device as shown in the print, but had added a feature which in the opinion of its mechanical department was not patentable. Unfortunately it was this feature which was covered by a valid patent and the vendor of the coupler having failed, the railroad paid $7,000 as a result of a *legal* opinion rendered by the *mechanical* department. You pay your assessment and an opinion costs you nothing additional—therefore why not get an opinion from the Association instead of sending, as frequently happens, some employee to the public library to go through 900,000 patents by main strength to determine a question with reference to which he has had no training.

Failure to properly use the Association has led our members into copying a patented device. For example, suppose you send me drawings of a steel car and that these drawings are not wholly complete because you omit to send figures showing what seem to you minor points, which "minor points" have been copied from some car which you have seen upon your road. Yet these minor points may be precisely what is covered by a patent; one man gets a patent on a gusset plate, another on a rectangular gusset, still another on one that is hexagonal. Of course, all these patents are not valid; in fact, I think many of the claims on steel car construction are wholly invalid as being for nothing but the substitution of metal in commercial forms for wood in forms equally well known, involving mere metal carpenter work. Just the same, it is the desire of our members not to buy lawsuits. Where the copying of a device involves litigation, it is safer and also fairer to use something else, however trivial the particu-

*Extracts from an address delivered before the Western Railway Club at Chicago, September 21, by George S. Payson, General Counsel of the Association.

lar patent may seem. Nothing is more dangerous than copying a patent, relying as a defense upon earlier devices. Suppose this is done and the road is sued and asks me to defend it. The judge is bound to ask me, "Why did you copy this patent?" I reply, "Because it is invalid in view of these old devices." The judge then asks: "Why don't you use the old devices?" The only answer is that we prefer the patented device. If so, it must be because it is better than the old devices open to anyone to use. If by such use we bear the strongest testimony to the utility of the device, we can hardly blame a court for holding the patent valid on account of such utility. I have never known in all my experience of any case where there has been deliberate intentional copying of a patent.

In examining a steel car I read about 20,000 claims, any one of which may be infringed. If a claim is found to be infringed, the question then arises as to whether it is valid, which involves a still more careful consideration of the patents prior to the one in question. While looking for infringement only, it is generally sufficient to read the claims, but when trying to decide whether a claim is good, I have to examine the drawings in detail and read part or all of the descriptive portion of the patent. This may explain why all opinions do not reach you in forty-eight hours after I get your request.

Whenever you decide that a device is worth making standard, or whenever any use of a device will involve considerable expense, you ought to get an opinion before such adoption or use. * * * Almost anything may be patented, and therefore whenever you make a device standard it is advisable to at least apply for a patent merely as a species of insurance. Unscrupulous men are continually appropriating the ideas of others and we have several times been put to great trouble and expense in cases where a man has taken out a patent upon a device invented by someone else—some railway employee for example—and made claim or brought suit against the road using such device. In such case we must prove the theft. This is hard to do and the consequent expense might be avoided if the road made application for a patent at far less cost than that involved in defending a suit.

If one of our members is sued, I want to be notified at once if I am to be in the case, that nothing may happen to affect our interests before I take charge. If you have a serious illness the proper step is to call a doctor at once, not to wait until you have but one chance in a hundred for recovery.

While we have won cases involving many millions of dollars, we have, since my connection with the Association, only lost one case, and that a very small one. As to prophecies with reference to litigation not under our control, we have, so far as I now remember, been right in every instance except one. We may not continue to maintain a standard so accurate, but to enable us to reach the highest possible standard of efficiency, there should be the fullest possible co-operation between our members and the Association.

I have known it to be said that the Association controls prices and that its purpose is to interfere between the railway that wants to buy and the supply-man who wants to sell. Not so. The Association has never, since I have been familiar with its operation, had anything to do with fixing prices, and I cannot conceive of a railway official paying any attention to what I might say on this point. The only time we are concerned with the amounts to be paid is when a question of settlement of some claims arises. In this case I, of course, use my best endeavors to obtain a settlement for the most reasonable price, to which I can see no possible objection.

If by interfering between the supply-men and a railway is meant advising the road, in pursuance to a request for information, that the device in question is an infringement of some patent, there must of necessity be such interference, but if, on the other hand, interference means what I know it has been intended to mean, an improper interference, blocking sales which ought to be made, I deny in a most emphatic manner that there has ever been such intention.

Where I find infringement I am ready at all times to hear the vendor or his attorney in opposition to my opinion. I have frequently voluntarily offered to supply-men an opportunity to present in person or by attorney their views as to their side of the controversy. As a result of such presentation I have sometimes withdrawn opinions already rendered, finding upon the new information given me that my previous opinion was inaccurate. So far as I have any pride of opinion, it consists in getting my opinions right, and as a first step to getting them right, full information is an essential requisite.

I frequently hear that my opinions are considered ultra-conservative. Possibly so. It is my rule never to pass a device that is a bald copy of a patent without an absolutely perfect defense, and this rule has repeatedly received the indorsement of our Executive Committee. It is further my rule that whenever I think a device is an infringement, although not a copy, a defense to the patent must come at least as close to such patent as does the infringing device. If this be ultra-conservative, I cannot help it.

Some time ago it was considered sufficient for a vendor to guarantee the cost of litigation, but such a guarantee is of little value. Suppose you spend $100,000 under a guarantee to protect you against litigation. Suit is then brought against you and your defenses are insufficient. What possible satisfaction is it to you to have the vendor pay the expense of litigation when you know that in the end you have got to come to the patentee's terms or abandon the device. Now, the bond which we require protects us not only against the cost of suit, but also against the expense incurred by having to stop using the particular device. We do not in all cases insist upon protection in the form of a bond. The Association does not solicit patents. If I were to attend to taking out a patent for one of our members, it might well be that later on I would be asked to defend suit brought under it against another member.

FOREIGN RAILWAY NOTES.

There were 47,150,384 passengers and 32,211,007 tons of freight carried on the Argentine railways in 1908. The movement of passengers from 1906 to 1908 has increased 25 per cent.

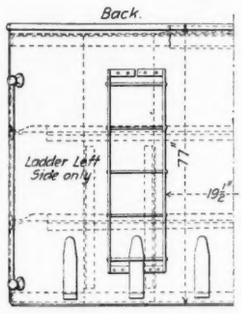
The Central South African Railway management has ordered two special compound engines, for which the chief mechanical engineer has gone to America to arrange. One will be a compound engine of the Mallet type and the other what is called a tenth-class 98-ton passenger engine of the superheater type. The heavy engine will be used for freight traffic and the other for passenger work.

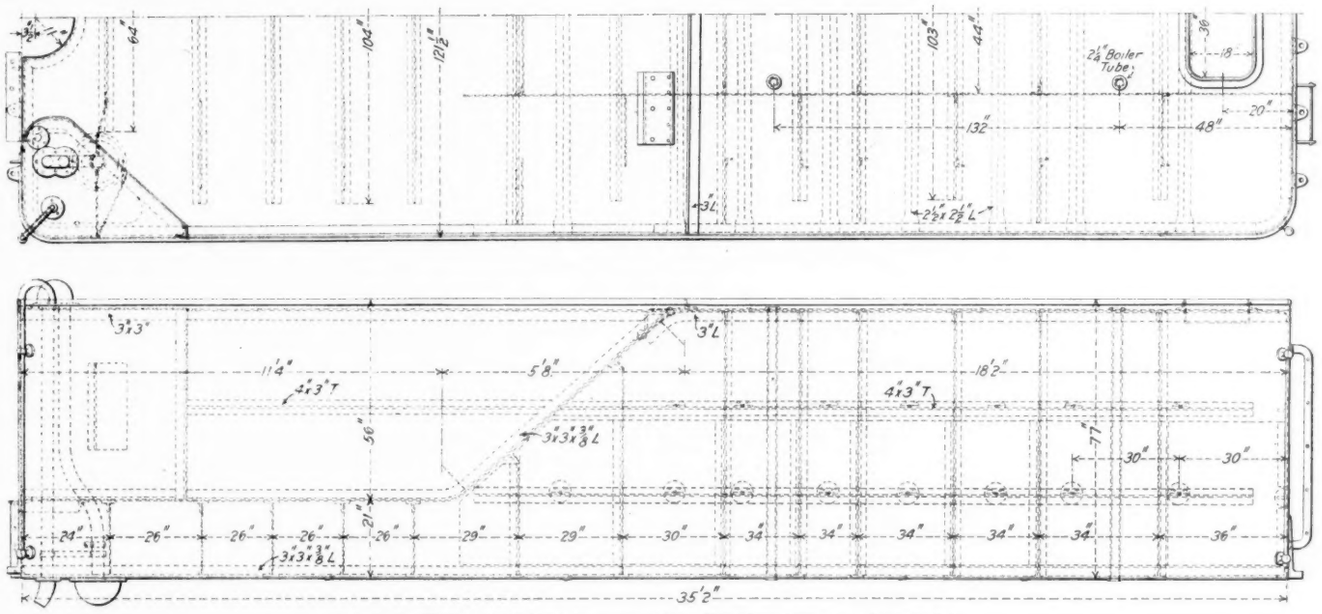
The board of railway directors of Sweden propose to ask the Riksdag for an extra grant of about 6,500,000 kronor (about $1,805,000). Of this sum 2,000,000 kronor is required for the completion of work on the Gellivare-Riksgransen Railway; 700,000 kronor for completing the double-track work on the line from Tomtelopa to Jarfba, and 500,000 for double-tracking the line between Ronninge and Jarna.

One of the last acts of the regular session of the Peruvian Congress was to guarantee an interest of 6 per cent. on the capital to be invested in building a railway from Chimbote to Recuay. This guarantee is limited to the sum of $170,327 gold per year. The railway will tap the most densely populated region of the republic of Peru, the Callejon de Huaylas, which is very rich in minerals and anthracite coal.

TENDER OF 12,000 GALLONS CAPACITY FOR MALLET LOCOMOTIVES, ATCHISON, TOPEKA & SANTA FE.

The *Railway Age Gazette*, November 26, 1909, published a description of the heavy Mallet passenger and freight locomotives that have been built for the Atchison, Topeka & Santa Fe by the Baldwin Locomotive Works. Among the interesting features of these locomotives is the tender, which has the largest capacity yet furnished to any locomotives in the world. This capacity is 12,000 gallons of water and 4,000 gallons of oil, while the total weight in working order averages about 230,550 lbs. There was a two-fold reason for this great capacity—the scarcity of water in the region through which the locomotives are to operate and the excessive requirements of these heaviest of machines. Large tenders have been developed so gradually that it is difficult to realize that it is but a few years since 2,000 gallons was ordinary tank capacity, and 2,500 gallons was large. A thousand gallons have been added at intervals until 7,000 and even 8,000 gallons have become so common as not to attract especial attention. It is not probable, however, that this last maximum will be exceeded for some time, except where water is scarce or of poor quality and it is found to be more economical to haul the quantity needed in the tender than to purify the water or haul it in tank cars.





Water Tank; Mallet Locomotive Tender for the Santa Fe.

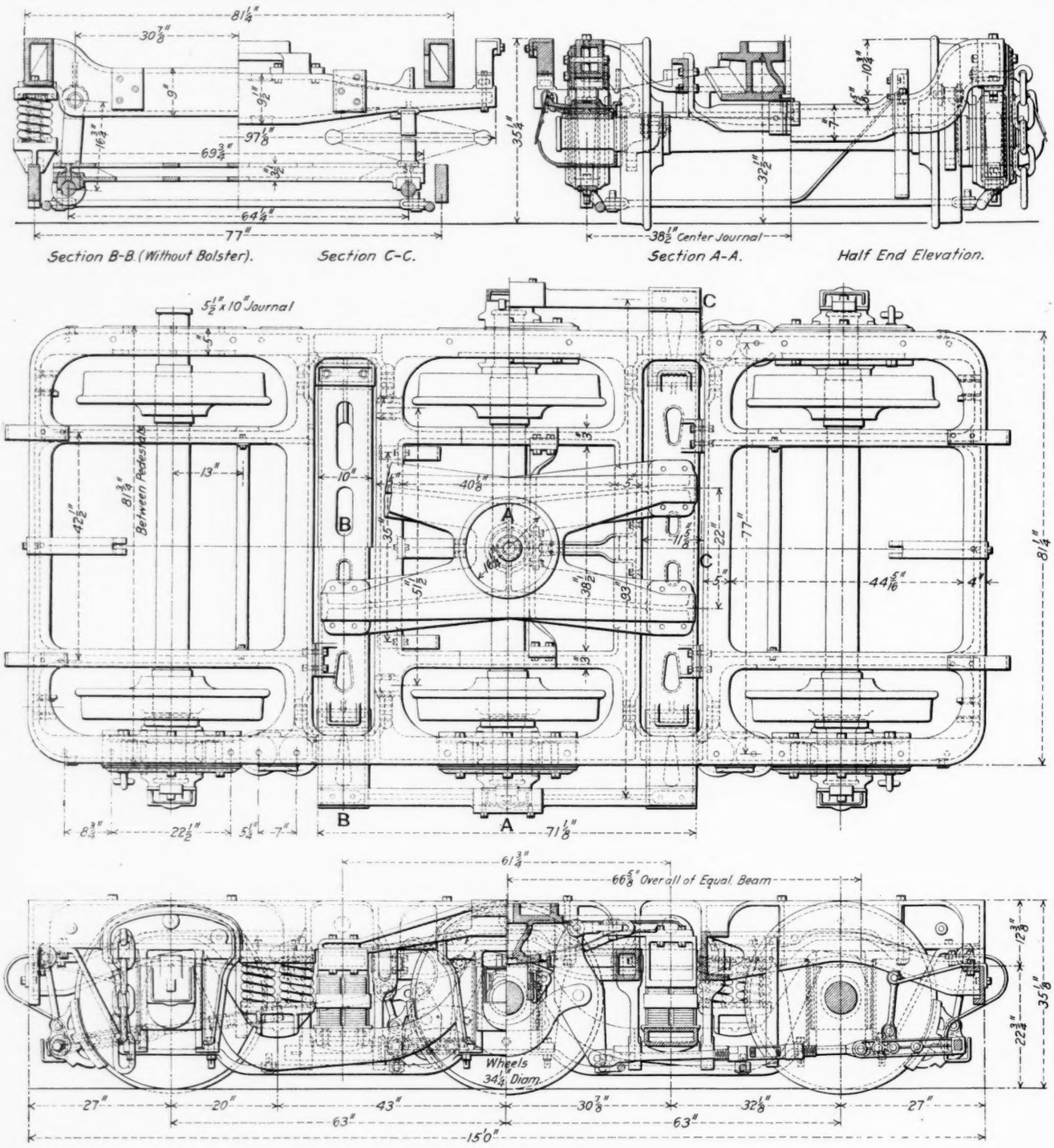
As far as constructional features are concerned, these large water tanks do not differ in general design from the smaller ones in common use, except in their adaptation to receive and carry the oil tank at the front end. As will be seen from the engraving, the back end closely resembles the ordinary tank. There is the same flat-topped body, with the slope at the front down to the top of the double floor. But instead of being bounded by the two legs of the U sides, the slope extends all the way across. At the front corners there are triangular towers that rise to the level of the back and in which are placed the siphon pipes and tank cock. The height of the tank is not excessive, for, of course, this was limited by the operating and clearance requirements, so that the load per sq. ft. of bottom is no more than in other large tanks, for the height is but 6 ft. 2 in. The width over the side sheets, also, is but 10 ft. 1½ in. It has been, therefore, by an increase of length that the desired capacity has been obtained, and this is 35 ft. 2 in. over the end sheets.

As for the details of the construction, the sheets are $\frac{5}{16}$ in. thick at the bottom and at the sides and ¼ in. at the top. The cross bracing is effected by means of angles flattened at the ends and rivetted to Ts that run along the inside face of the side sheets. They are spaced 30 and 32 in. from center to center. The splash plates are set at varying intervals throughout the length. In the double floor at the front they are 26 in. apart. Along the slope they are 29 in. and 30 in. apart, and in the body at the back they are 34 in. apart. In the body there are two 2¼-in. boiler tubes reaching from the top to the bottom plates that serve as drains for any splashing or overflow that may occur when the tank is being filled. Although there are no legs at the sides, as in the coal-carrying tender, the side sheets are run the whole length, thus presenting a smooth and even surface to the outside; sheets that are about 27 ft. long and 6 ft. 5 in. wide. The water tank is held to the frame by six heavy forged angle brackets at the back end and four at the front, as shown on the plan.

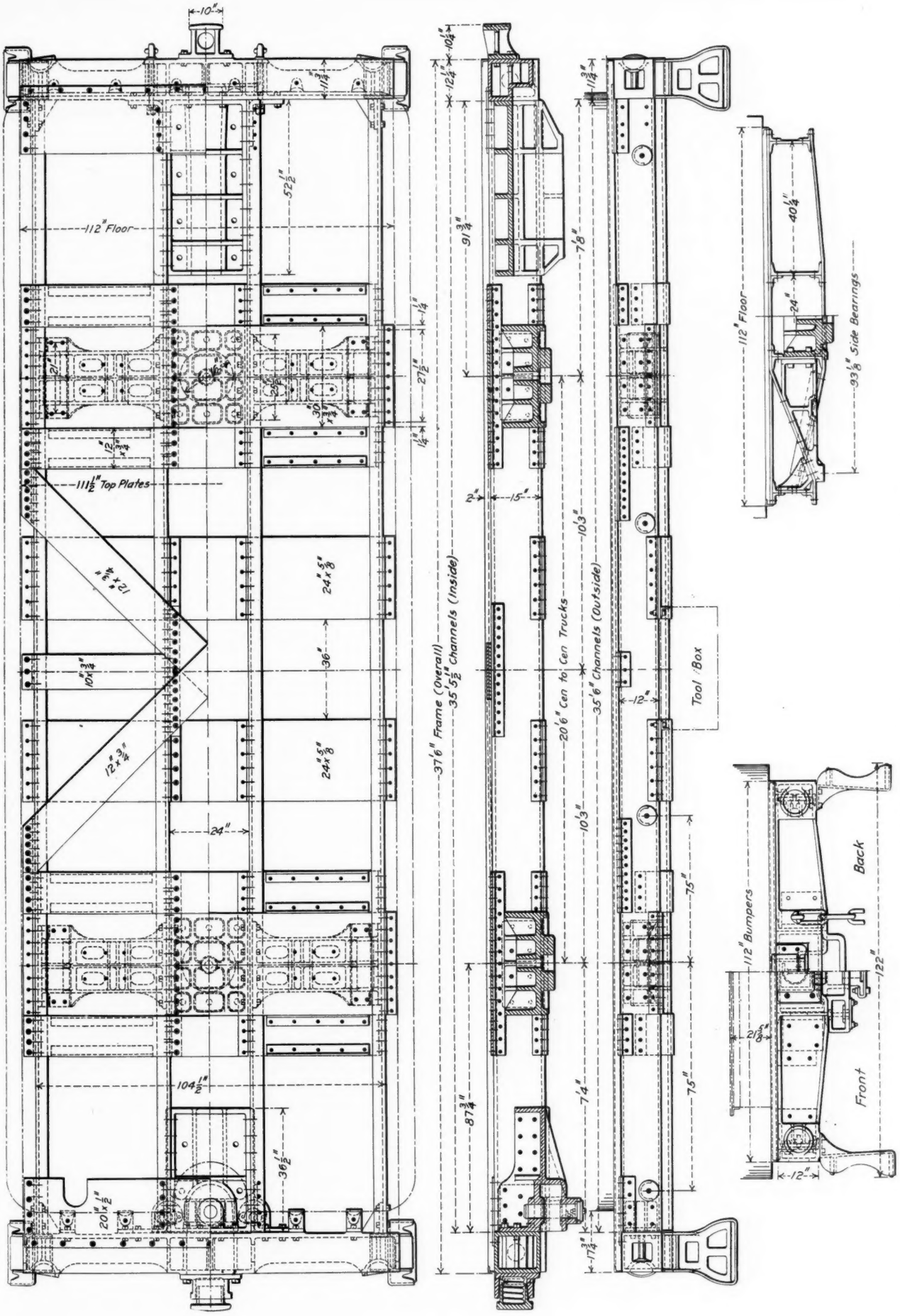
The oil tank is made to drop down into the space at the front end of the water tank that is bounded by the slope, the side sheets and the corner towers. It is carried on strips 3½ in. by 4 in., which run across the bottom and which rest on the smooth upper surfaces of the water tank. It is formed of ⅜-in. plates riveted to angles with the usual tank construction and is fitted in the interior with splash or surge plates in exactly the same manner as the water tank. The length of the oil tank is 16 ft. and its width is 9 ft. 6 in. There are two funnel openings by which it is filled, and it is fastened to the water tank by overlapping angles with a bolt passing through the legs in contact, as shown in the detail. These fastenings are located at the bottom in front, where there are four bolts in the angles, and at the back end, where there are two angles set 2 ft. 8 in. apart and with three bolts through each. It is fitted with two sling eyes on each side for lifting in and out of place.

The frame is a composite structure of steel castings and rolled shapes. The length over all is 37 ft. 6 in. and the width 9 ft. 3 in., so that the water tank overhangs about 3 in. on each side. The side sills are of 12-in. channels, weighing 40 lbs. to the foot, and the center sills are 15 in. deep and

weigh 55 lbs. to the foot. There is a central diagonal bracing in the frame, as well as ample cross bracing at short intervals, and the center sills are tied together at the front and back with heavy steel castings. The bolsters are composite of steel castings and plates, as shown in the engraving. There is a heavy steel casting bolted in between the center sills and another between the center and side sills on each side. The latter drops away to the outside so as to permit a heavy cover plate 30 in. by ¾ in. to be laid over the whole and come down from the top of the center to the bottom of the side sills, to which it is fastened by a rolled angle on the outside and a strongly-ribbed casting on the inside. This construction puts the top chord or coverplate in tension with a compression thrust on the bottom plates of the casting. The side bearings, following the trend of recent practice, are set well to the outside and are spaced 93⅛ in. between centers, which brings them just inside the side sills. On each side of the main bolster there are frame braces that might be called auxiliary bolsters. They are formed of 12-in. by ¾-in. plates that pass beneath the center sills, to which they are riveted, and up to about the center of the web of the side sills, to which they are riveted. These plates are presumably under compression, and so are stiffened against buckling by 3-in. by 3-in. by ⅜-in. angles riveted to their upper faces. Between these auxiliary bolsters there are two crossties set 36 in. apart, or 18 in. on either side of the center. They are of 24-in. by ⅝-in. plates riveted to the bottom flanges of all four sills. Above these there are two diagonal



Details of Truck; Mallet Locomotive Tender for the Santa Fe.



Tender Frame; Mallet Locomotive for the Santa Fe.

braces of 12-in. by ¾-in. plates riveted to angles which are, in turn, riveted to the webs of the channels. Attention is called to this feature of the design. By riveting an angle along the top and bottom edges of all four of the sill channels the drilling of holes in the valuable metal of the flanges is avoided, with its consequent weakening, while the whole is correspondingly stiffened. The only exception is to be found in four holes drilled in the top flange of the center sills close to the back end, to hold a light cover plate.

At the back end the filler between the center sills is a ribbed steel casting 52½ in. long running back from the cast-steel end sill. This extends across the whole end and has the sills abutting against its inside and is fastened to them by means of cast and forged angles. It carries pole pockets at the corners and has a seat at the center for the buffer casting. This filler does not, however, reach back to the bolster, so that all buffing stresses are transferred to and are are carried by the sills.

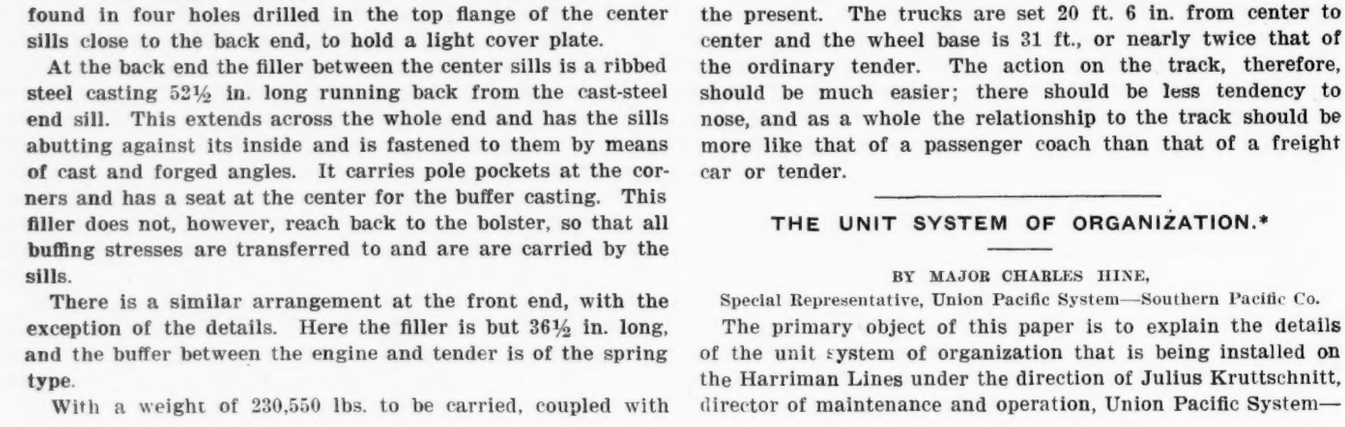
There is a similar arrangement at the front end, with the exception of the details. Here the filler is but 36½ in. long, and the buffer between the engine and tender is of the spring type.

With a weight of 230,550 lbs. to be carried, coupled with the very severe service that all tenders have to meet, it is evident that something better than the ordinary four-wheeled truck had to be provided. And it is here that we meet the real innovation and novelty of the tender. The truck used has six wheels and is a modification of the design of the usual form of six-wheeled truck that is used under passenger cars. In fact, it is a very close copy, the variations lying in the extensive use of steel castings for the framing and bolsters. There is the same arrangement of equalizers and springs and brake rigging that is to be found under Pullman cars, except that a nest of two helical springs set side by side is used on the equalizers instead of the usual single spring.

The frame, including the side pieces, end pieces and transoms, are formed of a single steel casting. This has a total length of 15 ft. and a width of 6 ft. 9¼ in. The transoms and end pieces are of channel section and the side pieces are of the box section. The possibility of getting such a design executed is not the least interesting part of the matter, for it is but a few years ago that a design of the casting presenting about the same problem to the foundryman was offered to a number of manufacturers and an order was declined except at prices that rendered its use out of the question.

The bolsters are box castings and the spring planks are also of cast steel. A steel casting, with four feet resting on the bolsters, is also used for the center-bearing arch-bar, and the center plate is cast solid with it. The truck is, therefore, interesting as an exemplification of the modification of an old design to new uses and new materials, and as marking the introduction of the six-wheeled truck into tender service.

These are the longest tenders that have been built up to the present. The trucks are set 20 ft. 6 in. from center to center and the wheel base is 31 ft., or nearly twice that of the ordinary tender. The action on the track, therefore, should be much easier; there should be less tendency to nose, and as a whole the relationship to the track should be more like that of a passenger coach than that of a freight car or tender.



Oil Tank; Capacity 4,000 Gallons. Mallet Locomotive Tender for the Santa Fe.

THE UNIT SYSTEM OF ORGANIZATION.*

BY MAJOR CHARLES HINE,
Special Representative, Union Pacific System—Southern Pacific Co.

The primary object of this paper is to explain the details of the unit system of organization that is being installed on the Harriman Lines under the direction of Julius Kruttschnitt, director of maintenance and operation, Union Pacific System—Southern Pacific Company. It is not desired so much to theorize as to what might, could, would or should be done, but rather to narrate what has been accomplished in actual practice.

An essential feature of the system for each unit is a senior assistant, who, ranking next to the head of the unit, remains in charge of the headquarters' offices and acts as executive officer. This senior assistant is supposed to see, with common-sense exceptions, all of the incoming and outgoing mail. If the other assistants are present at headquarters, they sign their own mail before it passes over the desk of the senior assistant for the latter's information. If an assistant is absent from headquarters he is represented, not by a chief clerk, but by a man of the wider experience of the senior assistant, who signs the routine mail in his own name. The absent assistant is advised of the action taken by such methods as common sense and courtesy may suggest. Matters highly technical are held for the return of the assistant, who is a specialist in that line.

The most difficult task in any organization of human endeavor is to correlate the activities of the workers on the outside with the necessary requirements of correspondence, records and accounting on the inside. The artisan in the shop,

*A paper read before the Western Railway Club, Chicago, January 18.

the traveling salesman on the road, the soldier in the field, the sailor at sea, the railway man on the line, all have their troubles with the man in the office. When the inside man knows the outside game at first hand such differences in points of view are minimized, friction avoided, and therefore money saved. Railway operation is the most exacting of human tasks. Like the conduct of a household, a farm, a hotel or ship, it is a continuous performance. Unlike those exacting occupations it must maintain its own communications over hundreds or thousands of miles of territory. So complex is its administration that chances should not be taken of losing money through half-baked decisions of partially trained office occupants. Most railway officials flatter themselves that when on the line they maintain a grasp on the office. Yet every hour in their absence action must be taken on matters which, apparently trivial in themselves, have far-reaching results. This statement is not a reflection upon the splendid ability and earnestness of railway officers. It is merely a recognition of the fact that a man can be in only one place at a time; that there are only 24 hours in the day and only 365 days in the year. The salary of one officer is negligible as a percentage of the operating cost of the average unit. Accordingly the system insists that the second best man of the unit, with practical outside training, shall stay at headquarters and sit on the lid. In some cases it has been found necessary to appoint another official to perform the previous outside duties of the senior assistant. In other cases it has been found that the outside work could be divided up among other members of the staff.

In any system of organization the most important unit is the individual. It is claimed that when one man signs the name of another the first by so much loses initiative and individuality. A man's name is his birthright, his signature his patent of enlightened manhood. Long habit on railways has perhaps minimized the pernicious effect of unconsciously building up one individual at the expense of many. Such industrial feudalism, however, can no more permanently endure than did the feudal serfdom of the middle ages. The unit system, therefore, insists that every man shall transact the company's business in his own name. There is nothing new in this. The whole system is really an extended application of the simple principles of train despatching. A train order is addressed impersonally "Conductor and Engineman." Where proper discipline obtains the signatures to the orders are genuine. When the oldest conductor lays off the youngest extra man does not sign the former's name to orders and reports. Addresses in official matters should be impersonal because of the possible difficulty of identification; because of the resulting elasticity in interior administration. One does not ordinarily address a letter to an individual attache of a firm, a bank, a hotel or a newspaper. He does not normally attempt to dictate who shall handle his communication. He leaves that to the intelligence and discretion of the organization that he is addressing. Under the unit system communications are addressed to the office—except when personal. The action taken, however, is by a real live man, whose identity is not concealed. The position is assumed that the recipient of a communication has the right to know what person is responsible therefor. The principle is established that except for a strictly personal staff, as for example, a private secretary, all persons report ordinarily to a headquarters or an office and not to an individual. The authority of such headquarters or office is always exercised by an individual. Authority, in an enlightened organization of society or industry, should be impersonal. Its exercise is highly personal.

The application of the above established principle to the reorganization of an operating division requires that the assistant superintendent shall become the senior assistant. If previously there is no assistant superintendent the trainmaster or most probable successor of the superintendent becomes the senior assistant.

The next step in making the division a complete unit with its head, the superintendent, in effect general manager, is to move the division master mechanic and the traveling engineer (road foreman of engines) to the same building with the superintendent. The division shop as a sub-unit is left in charge of a general foreman. The old theory has been that a master mechanic if located at the shops can better supervise the shop forces. It is believed that the volume of business and complexity of modern conditions have outgrown this theory. It is found in practice that the master mechanic spends much of his time in an office near the shop writing letters to the superintendent, the superintendent of motive power and other officers. Again, human nature is such that the master mechanic so located may unconsciously dwell on the plane of the division shop foreman at the expense of the former's mechanical responsibilities along the road and at outlying terminals. When this results his value as a division officer is diminished. The governing reason for locating the master mechanic and the traveling engineer with the superintendent is not only to gain a closer personal touch. Such contact is largely a matter of personal equation and of training regardless of location. The main object is to eliminate red tape by making possible a consolidation of files in one office of record. It has been demonstrated that, relieved of a bureau of unnecessary correspondence, the master mechanic can and does spend more hours among his men, whether in shops, on the road, or at terminals.

Assuming that the division engineer, the trainmaster and the chief despatcher are already located in the same building with the superintendent, the division is ready for reorganization. The general superintendent and the instructor visit division headquarters where are assembled the division officers and their old chief clerks. In an informal lecture of two or three hours' duration the principles of the system and its unwritten laws are outlined. Explanations are given of the revised standard circular of organization, which reads as follows:

..... RAIL..... COMPANY.
..... DIVISION.

OFFICE OF SUPERINTENDENT.

CIRCULAR NO. ....
..... 191....

Effective ..... 191...., this division discontinues among its officials the use of titles—Master Mechanic, Division Engineer, Trainmaster, Traveling Engineer and Chief Despatcher.

The following named officers are designated:

1. Mr. E. F.....Assistant Superintendent
2. Mr. G. H.....Assistant Superintendent
3. Mr. I. K.....Assistant Superintendent
4. Mr. L. M.....Assistant Superintendent
5. Mr. N. O.....Assistant Superintendent
6. Mr. P. Q.....Assistant Superintendent

They will be obeyed and respected accordingly.

Each of the above named officers continues charged with the responsibilities heretofore devolving upon him, and in addition assumes such other duties as may from time to time be assigned.

Such of the above as are located in the same building have one consolidated office file in common with the superintendent.

All reports and communications on the company's business, originating on this division, intended for the superintendent of for any assistant superintendent, should be addressed simply, "Assistant Superintendent" (telegrams "A. S.") no name being used unless the communication is intended to be personal rather than official, in which case it will be held unopened for the person addressed. It is intended that an assistant superintendent shall always be on duty in charge of the division headquarters offices during office hours. The designation of a particular assistant superintendent to handle specified classes of correspondence and telegrams is a matter concerning only this office. Each official transacts business in his own name, and no person should sign the name or initials of another. The principle to guide subordinate officers and employees is to be governed by the latest instructions issued and received.

Train orders will be given over the initials of the train despatcher on duty.

The modifications of pre-existing organization and methods herein ordered have been carefully worked out to expedite the company's business by the reduction and simplification of correspondence and records. It is expected and believed that officers and employees will insure a

successful outcome by lending their usual intelligent co-operation and hearty support.

Officers and other persons outside the jurisdiction of this division are requested to address official communications, intended for the superintendent or any assistant superintendent, "Superintendent, ... Division, ..." (telegrams "Supt."), without using the name of the superintendent except for personal matter.

C. D., *Superintendent.*

Approved: A. B., *General Superintendent.*

It will be observed that no distinct grade of senior assistant is created. The unwritten law is that whatever assistant is assigned to the charge of the headquarters' office becomes the senior for the time being. It was originally intended that different assistants should be detailed as the senior for certain definite periods. In some cases such a rigid rule may be necessary. The experience of a year indicates that the incidents and casualties of the service may usually be depended upon to let the situation work itself out. This is gratifying, since in such matters self-suggesting procedure is preferable to rigid rules. For example, if an assistant sprains his ankle or mashes his foot the superintendent can assign him to the office and send the then office man out on the road. Vacations and enforced absences afford the superintendent an opportunity to cover the situation by a common sense assignment. On one division the senior assistant was necessarily absent for some weeks. The maintenance assistant who happened to be next in rank was busy outside relaying the division with new steel. The third man, the mechanical assistant, had few troubles of his own in summer, and to him fell the opportunity to be broadened by a tour in the office. The superintendent and the other assistants, including the old traveling engineer, did the engine chasing. No circular was necessary, and there was less confusion than if two dispatchers had exchanged tricks.

In order that their authority may not be restricted when meeting a given emergency it is necessary to give the division officials the uniform title of assistant superintendent, without the limiting effect of a descriptive phrase. If any one can coin titles that will describe duties and not, under railway customs, restrict authority, such titles will be welcome. When a vacancy occurs the circular states, "Mr. ..... is appointed an Assistant Superintendent vice Mr. ....." His assignment to duty by the superintendent is verbal. If a superintendent should find himself with an assistant unfitted by temperament or experience to cope with a wider range of duties he could quietly restrict such assistant to a prescribed limit.

The assistant superintendents when at headquarters, except the senior assistant, have equal rank. On the road they have the relative rank indicated by the circular or the current working time table. In case two or more find themselves together and an interruption to traffic or other emergency requires, the highest on the list takes charge and becomes responsible. The system forces more officials to assume responsibility and by so much increases the protection to the company's interests. More and more is heard about "this division," and "the company" and less and less about "my department."

Most division officers have welcomed the title of assistant superintendent as a real promotion and as an increase in opportunity. Some still feel the loss of a distinctive title. Time alone will prove that railroading has become great enough as a profession to carry its own marks of distinction and to permit of a properly balanced specialization along the lines of greatest aptitude. Men like Julius Kruttschnitt, James McCrea, L. F. Loree, Epes Randolph, J. W. Kendrick, F. A. Delano and W. W. Atterbury, have not lost any reputation as civil and mechanical engineers because of their greater prominence as railway executives. For the same reason that a chief engineer blushingly accepts the title of vice-president, a division engineer should modestly aspire to the position of assistant superintendent. This is one of the features of the unit system that it will take a generation to work out. Eventually an official cannot hope to perform the duties of chief engineer, or superintendent of motive power, until he has had experience in the grade of division superintendent. When superintendents are selected from diversified sources this will be possible. An advantage of the uniform title of assistant superintendent is that, as in the case of vice-presidents, it necessitates speaking of a particular official by name. When any official is away from his headquarters, he is addressed by name.

The unit system makes a distinction between superior or co-ordinate units and subordinate units. Employees address "Assistant Superintendent." If they addressed "Superintendent" there would be an implied obligation on the part of the superintendent to answer. If his personal action is desired he must be addressed by name. Even though "assistant superintendent" is addressed the reply may be signed by the superintendent himself. Subject always to his superior's wishes, the superintendent makes his own office rules as to what he shall personally handle. It is up to him to see all, a part, or nothing for a given period, just as he sees fit. Should the superintendent's letter call for further information from the employee, the latter's reply would still be addressed, "Assistant Superintendent." For all that the sender knows the particular officer may be necessarily absent when the letter is received. Numerous old conductors have expressed their appreciation of the fact that a man knows what official has addressed him, and that it is no longer possible to be jacked up by a clerk using the name of an official.

Communications from superior or co-ordinate authority are addressed to the head of the unit, the superintendent. In his absence routine matters for higher or co-ordinate authority are signed by the senior assistant who appends to his own title the explanatory phrase, "For and in the absence of the superintendent." Going down on the division no such explanation is necessary, as the authority of any assistant superintendent carries over the division itself.

The superintendent being in effect general manager of his division is given charge of division stores as well as division shops. He must, therefore, obey the instructions of the general storekeeper as well as the superintendent of motive power. The general storekeeper has thus placed at his disposal all the administrative machinery of the division. Instead of a lack of practical sympathy between the stores and the users of material, it is made the duty of the superintendent and the assistant superintendents to watch material costs as well as labor costs, to help keep down interest charge on stocks as well as overtime. A railway harnesses the forces of nature, including its divinely human elements, for one purpose, the manufacture and sale of an intangible commodity, transportation. The more closely interwoven the constituent parts of production the more efficient and economical should be the output. When weaknesses develop, when education is needed as to the increased importance of a given element, the remedy is not necessarily the creation of a separate department. A general storekeeper there should be, whatever his title, technically expert in his important specialty, responsible to the general manager and in a position to insist upon efficiency to the extent even of ordering material moved in special trains when it is true economy for the company to do so.

It will be noted that the superintendent, as the representative of all so-called departments on his division, has about as many superiors as he has assistants. The work of these superiors is balanced by the general manager. The scheme will not be fully effective until the unit system is applied to the general offices, making the general superintendent, the chief engineer, the superintendent of motive power, the general storekeeper, the car service agent, the superintendent of telegraph, the signal engineer, and the superintendent of dining cars all assistant general managers with one consolidated office file, and their activities co-ordinated by a senior as-

sistant general manager at headquarters. Thus far only one general office, that of the new Oregon & Washington at Seattle, has been reorganized in accordance with this conception.

The number of divisions now reorganized is twenty-one, with eleven still to follow. The number of assistant superintendents on a division varies from three to twelve. Every superintendent has shown his ability to handle as many assistants as the management may give him. The most gratifying feature of the reorganization is the fact that in all cases the talent at hand has been sufficient. No importations have been necessary. The incumbents of official positions have responded splendidly to the confidence reposed in their ability. Some divisions have gone farther than others. This always has been and always will be the case. Every one, however, has made real progress, some of it unconscious. The human element has been recognized. Division officers who from lack of early breadth of opportunity have not the qualifications for senior assistant are not required to fill the position. Their services to the company have been too faithful to warrant humiliation or elimination. Their grasp of present conditions is greater than could be that of student successors. When, in the course of nature, a new crop of officers matures it will be ripened younger but attain a fuller growth.

Consideration has been shown for the clerical forces affected by the changes. No individual has had his salary cut. As vacancies occur through natural causes salaries are readjusted; some increased, some diminished to meet the new conditions. All of these matters are left to the local officers. Principles are enunciated, suggestions made, but responsibility for details is left to the officials on the ground. The system means more officers and eventually fewer clerks. Probably by a cheese paring effort enough clerks could be eliminated to offset such increases in official salary lists as have been found necessary. The management has felt that increased supervision will warrant the outlay. This liberal policy is justified by good business sense rather than by the prosperity of the Harriman Lines. The poorer a road the more money it should spend for supervision and the development of esprit de corps.

Formerly office work was grouped around officers. This resulted in petty principalities and bureaucratic administration. By tearing down some office partitions there were razed those figurative department walls, which so often operate to keep in the man who is trying to keep the other fellow out. Under the new conception the work is grouped by classes. The technical term among business experts is "the concentration and co-ordination of routine and related processes." At a small roundhouse a handy man may be machinist, boiler maker and car repairer. In a large shop for obvious reasons the boiler makers and machinists are segregated. So, in an office, stenographers may be pooled, accountants segregated and clerks concentrated for the general good of the office work rather than for the fancied importance of a particular phase. The key to success in the unit system is a properly handled file room. It is given preferred attention and whatever force is necessary. When all the clerks of the division are pooled no difficulty is experienced in finding sufficient to handle the file room. Williams' "Railroad Classification" is being installed with a view to uniform filing over the Harriman Lines.

As a general proposition officers at headquarters should not exchange written communications among themselves. Superintendents must apply this principle without hard and fast rules. For example, the superintendent of a heavy division, being on the line some 200 miles from headquarters, very properly addressed a joint letter to each of his ten assistants, calling their attention to a wreck he had just picked up, and as the lesson to be learned enjoined upon them a vigilant enforcement of certain rules. It has been found possible to reduce the correspondence of divisions reorganized from 30 to 50 per cent. Even with reduced clerical forces night and Sunday office work have been eliminated. The great reduction is made possible by the constant presence of the senior assistant, who is alert to discourage the letter-writing propensities of headquarters. It is expected that when all of the units under the Chicago office are reorganized there will be a net saving of at least 500,000 letters per year. Every letter costs a few cents to produce. Its retarding effect upon administration cannot be measured in money. Its dwarfing influence upon the individual initiative of the man below is likewise indeterminate. It is expected also that when the reorganization is completed numerous routine reports can be omitted.

It is not expected that a mere change of title or an assignment by a superintendent will make a man a skilled mechanic or an experienced engineer. For technical questions arising on a division the most expert knowledge available will continue to be utilized. It is claimed, however, that as the average division officer has been in the service at least ten or fifteen years, he cannot fail to have acquired some familiarity with the requirements of the various branches of the work. The old trainmaster may as third trick despatcher have ordered an engine taken down and towed in without awakening the master mechanic. By so much more should he with wider experience be able to say whether or not the company's interests are being best observed in the handling of a locomotive that may happen to come under his notice. The mechanical assistant cannot be everywhere, and any help that his fellow-officials can render the company should receive. Conflict of authority is avoided by the common sense and courtesy of the assistants and by the attention of the superintendent. Nothing makes men so conservative as responsibility. It is claimed that the superintendent on the ground is better able to decide these questions intelligently than is a hard and fast code formulated by a man behind a distant desk. What is construction to-day will be maintenance to-morrow. What is motive power at the turntable becomes transportation at the switch.

Each officer continues responsible for his branch of the work until otherwise indicated by the superintendent. The maintenance assistant is not allowed to plead transportation duties as an excuse for defective track. With him track must come first. When the train stops he cannot inspect track until it resumes. Meantime he may be able to minimize the delay by seeing that employees perform their duties promptly. He is not allowed, except for insubordination, to discharge employees on another assistant's payroll. He is expected, however, tactfully and politely but forcefully, to insist that the rules be obeyed. The faithful old employees need only encouragement to perform their duties well. The young and inexperienced require constant supervision and instruction. Due to its great extent of territory a railway exercises less control over its employees than any other line of organized effort. The safety of lives and property demands the greatest possible intelligent supervision.

Adaptability to changed conditions is largely a matter of temperament. Among his intimates one can usually predict in advance what position a particular person will take on a question of politics, religion or organization. Some men believe in an early convergence of authority, in wide latitude of discretion. Others believe that the best results are obtained by postponing decisions until the highest possible authority is reached. On important questions there are usually two schools of opinion. Nearly every civilized country has two great political parties. On the railways of America there will always be diversity of opinions and practices as to the organization of forces. The executive officers of the Harriman Lines have felt that the individual will be broadened and the service correspondingly improved by the introduction of the elastic methods herein outlined. While many are enthusiastic, not all of the persons affected are convinced. It is to the credit of the latter that in spite of honest doubts all have contributed more or less to the success of the scheme. The work is being kept on a high plane, guided by those exalted ideals of duty: freedom from personalities, and the good of the service.

SCHERL MONORAIL GYROSCOPE CAR.

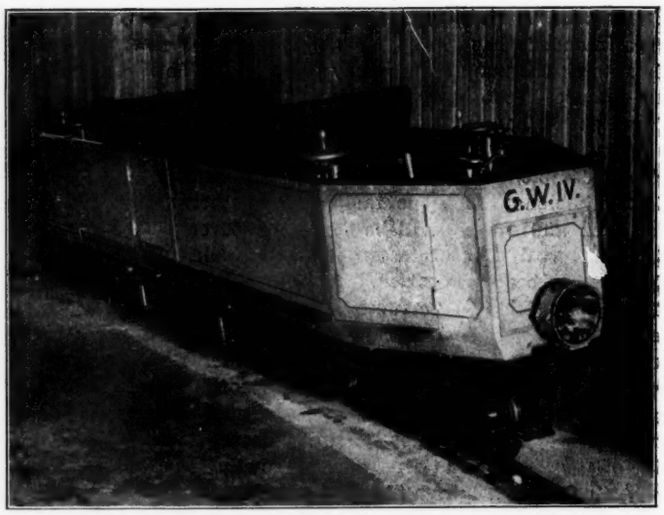
The illustrations herewith show two views of the German gyroscope monorail car, invented by Richard Scherl. This car, shown in exhibitions and trial runs which are now being made in Brooklyn, N. Y., was referred to in these columns last week.

The car has a total seating capacity for six passengers, including the motorman. It is 18 ft. long and 4 ft. wide and weighs 5,500 lbs., about 5½ per cent. of which weight is due to the two gyroscopes. These gyroscopes, which are carried underneath the car body, are operated within steel chambers, the pressure in which is reduced to a vacuum. Each wheel weighs about 110 lbs. and revolves at a speed of 8,000 r.p.m. They revolve in opposite directions and are operated by 115-volt, d.c., shunt-wound motors, of less than ½-h.p. each. These motors have nothing to do with the propulsion of the car, but affect its stability only. Their ability to maintain the car body in an upright position has been demonstrated in the trials at Brooklyn. The gyroscope, it is said, will continue to revolve and maintain the car's equilibrium for about an hour after the current is interrupted. Perfect stability was maintained even when a passenger was carried seated upon the side of the car, running at about four miles per hour on straight track and three and one-half miles per hour on curves. On meeting curves, the car would, of course, incline toward the center, but this movement would not take place until the actual curve was reached. There is apparently no provision for the cars being prepared to meet a curve, a detail which would be of greater importance as the speed is increased. It is not possible with the single rail to prepare the car for a curve as is the case when two rails are used.

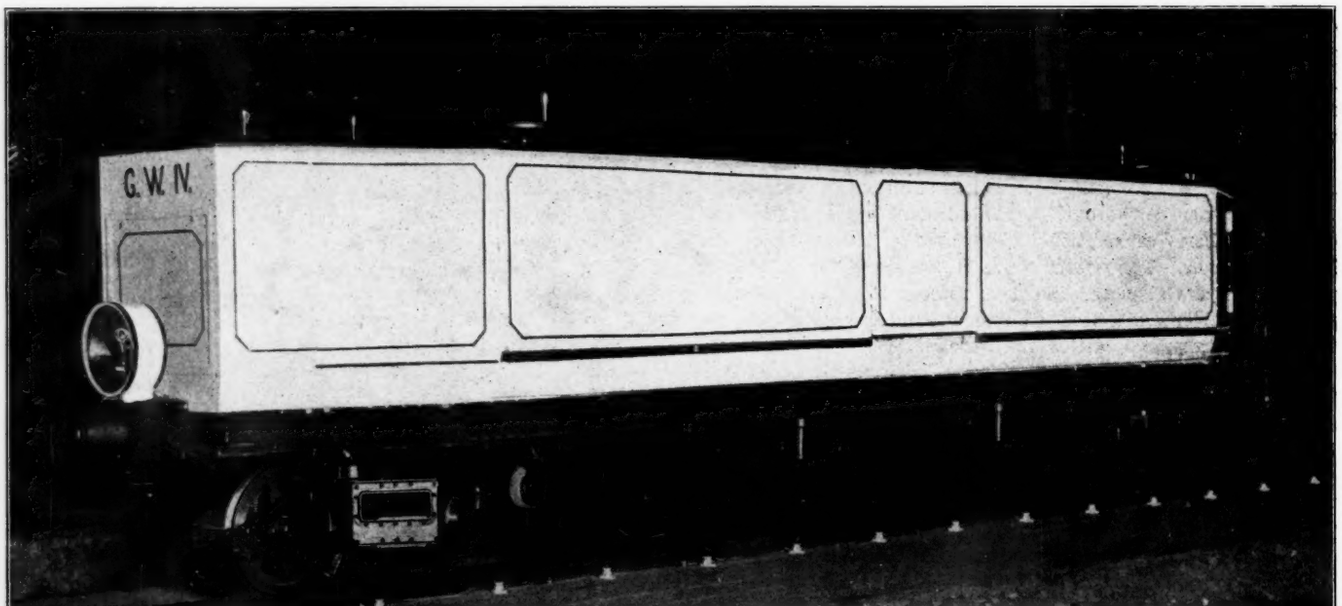
The car is propelled by two 2-h.p., 115-volt, d.c. series motors, through gearing to the wheels of the two-wheel trucks. These wheels are double flanged to conform to the section of the 20-lb. rails. The two current collectors are suspended near the rear wheel of the rear truck, one collector on each side. The two feed wires run along the ties a few inches below the top of the rail. These collectors are shown in the illustrations, as is the general construction of the car body and the truck frames. The truck pin centers are 15 ft. apart and the wheels are 12 in. in diameter. Inside-hung brakes are provided on each truck.

There are four emergency balance rods carrying small rollers which can be dropped to the ground in case of accident. The hand wheels for securing these roller spindles are seen in the illustration.

Gyroscope monorail cars of the Scherl and of the Brennan types have been undergoing tests for some time in Germany and England, but the present demonstrations in Brooklyn are the first which have been made in this country.



Scherl Monorail Car on Curve.



Scherl Monorail Gyroscope Car.

RAILWAY BUILDING IN CUBA.

Active operations in railway building are going on in the provinces of Pinar del Rio, Santa Clara, Camaguey and Oriente, in Cuba, and many thousand men are employed. There appears to be a pronounced tendency to close up the gaps in the lines and to strike out across new territories, so as to give even the most remote corners of the island convenient connections by rail with the largest cities or the smallest towns. With the work on hand finished in the Province of Oriente, the whole southwestern portion of it will be opened up. The general manager of the Cuba Railroad predicted the opening line between Bayamo and Santiago will be opened in June, 1910. President Gomez recommended, in his last message to Congress, the building of a line between Nuevitas and

Caibarien on the north coast of the island, and a bill has since been introduced in Congress to subsidize the construction of this line. At Camaguey a new station is being erected. The new work in Santa Clara Province consists of an extension south from Placetas to Trinidad. This branch is about half finished and runs between and parallel to the Sancti Spiritus and the Cienfuegos branches.

REJECTING LOADED FREIGHT CARS AT INTERCHANGE POINTS.

The paper at the meeting of the Western Railway Club, Chicago, on the evening of October 19 was by William Baird, shop superintendent of the Chicago, Burlington & Quincy, at Plattsmouth, Neb. It was entitled "Twentieth Century Inspection; or, Run, Repair or Transfer," and dealt with the delays caused to loaded cars at terminals by the refusal of receiving lines to take them, owing to defects. Mr. Baird said:

"Substantially one-half of all of the tonnage offered by the patrons for transportation must pass beyond the initial carrier to reach its destination, and much of this interchanged tonnage must be handled by from two to a dozen lines in reaching its journey's end. Upward of 800,000,000 tons per year come under this head. This means that perhaps 100,000 cars every day, in order to move their loads to destination, must pass over several railways on a single trip. We know, also, that this interchange between railways does not take place in the open country where room is plentiful, but occurs in the commercial centers where congestions are easily caused, where room is always at a high premium, and where cost of operation is invariably high. Yet, in these terminals, where the minimum of delay produces the maximum of trouble, it is no uncommon thing to see important trains held for hours to get the through cars from connections, only to find that one-half the cars were refused by the car inspector, and why? Because a roof-board was broken, or a corner knocked off a piece of sheathing, or a wheel had a flat spot that was just to the limit, and had run perhaps 300 miles over the delivering company's line, but as it was just 2½ in. it must go to the repair track, not of the receiving line, but back to the delivering line, to have a pair of wheels applied, resulting in a delay to the contents of 24 hours. What encouragement is this to the freight agent, who has solicited the shipment, telling the shipper if he will only ship by his line he may be assured of prompt service?

"What answer are we mechanical men prepared to make? Who is responsible for the delay? Simply the M. C. B. rules in saying if such and such a defect exist on a car it 'may' be rejected, and rejected it is, regardless of the contents. The car is moved from the transfer back to the delivering line yard, kicked in on a track with a lot of other bad orders, and on the following day is taken to the repair track, but in the meantime is further damaged in switching and perhaps the contents as well, and, in addition to the delay, the railway has a claim to pay, all because a car inspector, who, in many cases, does not give a thought in connection with the movement of equipment other than to look for defects as laid down in the M. C. B. rules; has no idea of the responsibility of the railway to the shipper, and cares less, but just loves to 'get even' with the inspector of the delivering line, who at some time sent cars back to him. While perhaps this method of handling business was all right in its day, it has had its day. The railways and the business world have outgrown such methods, and I believe we are ready for a change.

"At some of our large interchange points local rules have been adopted that keep the loaded car moving forward. When such rules have been in force for any length of time the roads would not think of returning to the set-back plan, but these local rules are not sufficient for the business of the whole country. What is wanted is a rule embodied in the M. C. B. rules in large type, reading somewhat like this: 'LOADED CARS MUST BE ACCEPTED. IF NOT IN A SAFE AND SERVICEABLE CONDITION, THE RECEIVING LINE SHALL REPAIR THE CAR OR TRANSFER THE LOAD.' In other words, we must take the load and 'run, repair or transfer.'

"The writer was a member of the Rocky Mountain Railway Club and tried several years ago to get a recommendation to the Master Car Builders' arbitration committee advocating the universal adoption of the 'run, repair or transfer' plan by revising section 1 of M. C. B. rule 2. A year later a similar recommendation was offered in the Western Railway Club by another gentleman. Both clubs refused to consider them, but I believe the time is now ripe for this club to send in some such recommendation to the M. C. B. Association, and with all its energy urge that twentieth-century inspection become a part of the rules of 1910. The question of whether the delivering or receiving line should stand the cost of transfer is one that will arise, and no doubt will cause some dissension; some will favor charging the cost to the delivering line, and others to the receiving line, but let us not allow anything to cloud the issue or keep us from overcoming the practice of rejecting freight when tendered in interchange between railways.

"If a joint inspector is employed, whose duty it shall be to pass upon the cars and issue authority for transfer, it does not so greatly matter which road stands the expense, just so the practice is uniform throughout the country; but where there is no joint inspector, the writer, after long experience, has noted that at points where expense of transfer is borne by the receiving line, the work is apt to be done more quickly and at much less cost. Besides, all disputes and resulting correspondence are thus avoided. But whatever our individual views may be, the railways have now adopted a uniform rule defining responsibility in case of transfer taking place in transit, and if experience shows the rule can be improved, it is fair to assume changes wil be made. The adoption of this rule fixing responsibility for cost of transfer unties the hands of the M. C. B. Association, and makes it possible to adopt the 'run, repair or transfer' practice.

"It may be pointed out that lines deliver more loaded cars than they receive, but even so, do we ask the wholesale merchant, who delivers his freight at our depots, to transfer it across our freight sheds and stow it in the car? No; we solicit him for his freight and gladly pay for the stowing in our cars. Why, then, expect a railway, which gives you a carload of freight, to stow it in your car because you do not want to run the car in which it is delivered to you?

"Before the day of physical connections between railways, when but little business was destined beyond the initial line, freight was carted across from one railway to another and placed upon a platform, being later stowed into the car supplied by the receiving line. When physical connections were established to meet the demands of a growing business, what rights or privileges were acquired by the receiving line that it did not possess before, and what rights which the delivering line previously enjoyed were taken away from it? What little merit there might at first appear in sanctioning the practice of rejecting loaded cars seems to be removed when it is remembered that all railways are both delivering and receiving railways, and it does not require an expert to see at a glance the folly of road A returning to road B a carload of his customer's freight in order that B may put it in a car suitable to A and then have B return a carload of his customer's freight to A in order that A may place it in a car suitable to B, thus handling two carloads in directions contrary to their destinations, delaying both, congesting terminals, inviting criticism from shippers and demoralizing things in general.

"If this set-back practice could be carried on out in the open country on some branch where other business would not be affected, the result, while fearful to contemplate, would

not so sorely reflect upon us mechanical men as is now the case where we have carried our set-back practice into our crowded terminals, where every inch of space is needed. It is bad enough to have inspectors who wil take advantage of the rules. How much worse to have rules officially sanctioning the rejection of business after being accepted from the shipper and started on its journey?"

The secretary read a number of letters from prominent M. C. B. Association members, which indicated a diversity of opinion on the subject of the acceptance of bad order loaded cars.

R. E. Smith (A. C. L.) thought that the present M. C. B. rules should be sufficient to cover the case, and was in favor of making the car owner responsible for defects excepting in brake-shoes, air hose, brasses, draft bolts and draft springs. George A. Hancock (St. L. & S. F.) favored the views expressed by Mr. Baird, and presented some arguments to show that it was best to run, repair or transfer loaded cars in interchange. J. W. Marden (B. & M.) sent a telegram, saying that it is his road's regular rule to accept defective loaded cars and repair them or transfer the load if necessary. J. H. Manning (D. & H.) sent a letter, saying he favors the present M. C. B. rules, and thinks them sufficient to cover the requirements. F. W. Dickinson (B. & L. E.) disagreed with Mr. Baird and favored a strict enforcement of present M. C. B. rules. This sentiment was also expressed in a letter from F. H. Stark, of the Pittsburgh Coal Company.

H. La Rue, of the Rock Island, spoke in favor of the Chicago agreement governing car interchange. It is working successfully, causing little delay to the movement of loaded cars. W. E. Symons (C. G. W.) spoke at length on the variation in the strength of cars as offered in interchange. He gave figures to show the magnitude of the blow delivered by heavy cars in switching and the comparative buffing areas of freight cars, indicating a variation of 400 per cent. in the latter. Mr. Symons believes that in the future there will be a government board of inspectors which will determine on standard construction of freight cars in interchanges and decide which are sufficiently strong for general traffic, just as the present government inspection of ships and steamboats determines whether their construction is safe. Major Charles D. Hine spoke on the value of organization, and thought that many of the difficulties of interchange could be overcome by a better education of the car inspectors. F. W. Brazier (N. Y. C.) said that at many of the large transfer points the troubles complained of by Mr. Baird did not exist, and at the Niagara frontier 40 per cent. of the cars offered in interchange, if defective, are either repaired or the load is transferred.

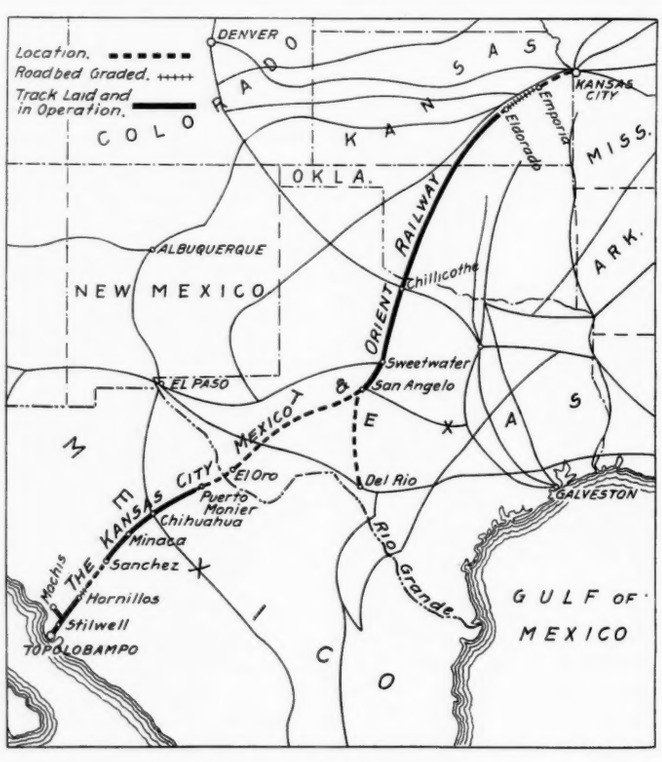
A. E. Manchester (C., M. & St. P.) gave a brief history of the development of the Chicago agreement and of the resons which led up to the changes in the M. C. B. rules requiring the car owners to be responsible for many defects. Le Grande Parish (L. S. & M. S.) said that much of the trouble in interchange is caused by the low capacity, weak wooden cars and the rules should be gradually modified so as to more powerfully discourage the use of weak cars in that service. T. H. Goodnow (L. S & M. S.) said that the use of steel cars in the Chicago district has resulted in 75 per cent. reduction in the number of repair cards required. Arthur Hale, of the American Railway Association, reviewed the discussion in an admirable manner, and said that the present M. C. B. rules really admit of the twentieth-century inspection advocated in Mr. Baird's paper, thought they do not actually prescribe it. He said that the present loaded car movement in the United States amounted to 185,000 cars a day, and of these fully 100,000 are interchanged. Mr. Hale thought that a great effort should be made to avoid setbacks; that is, the return of loaded cars to the offering road instead of having them continue on to destination, and to have the necessary repair or transfer made by the accepting line. The Chicago agreement and those in use at St. Louis, Cincinnati and Niagara are really based on the principles advocated by Mr. Baird, although the rules do not state the case as definitely as Mr. Baird has stated it in his paper.

It was brought out in a further discussion by H. E. Passmore (T. & O. C.) and by Mr. Goodnow that the so-called Chicago agreement governing interchange of cars is working under a system based on written laws or rules, but is so flexible as to admit of the interchange of cars by temporary memorandum or record which the rules did not fully cover and which was designated by several speakers as "local option"—that is, the inspector exercises some discretion in meeting local requirements, and thus facilitates the movement of cars both empty and loaded and prevents the return of many defective loaded cars to the delivering road. The time required to inspect a long train was considered a matter of some interest, and the general impression was that an inspector would require at least one or two minutes for the inspection of one car, but Mr. Parish reported that although they had some idea, at Elkhart it was quite frequently the case that a train of 60 cars was inspected in 12 minutes, which would make an average of only 12 seconds per car.

It was evident that there was a strong sentiment in favor of Mr. Baird's views and a desire that the M. C. B. rules shall be modified so as to meet them.

TRAFFIC REPORT ON THE KANSAS CITY, MEXICO & ORIENT.

At the request of the London finance committee and a large number of American stockholders of the Kansas City, Mexico & Orient, E. Dickinson, vice-president and general manager,



The Route of the K. C., M. & O.

and J. T. Odell, vice-president, have made a report on the probable future earnings and traffic possibilities of the property, which now extends from Wichita, Kan., through Kansas, Oklahoma and Texas to San Angelo, 510 miles.

The report is divided into two parts, estimating future earnings of the entire road in the United States and of the entire line in Mexico respectively. The railway between Wichita and Sweetwater, 432 miles, was finished in January,

1909, and the report was made in November, 1909. Freight and passenger earnings from January to November had to come from the development of an almost virgin territory in the states of Texas and Oklahoma. The chief engineer and the freight traffic manager of the Orient were asked to make an estimate of the earnings of a complete line to the Rio Grande, basing their computations on the earnings of the section now in operation. They figure that the average earnings per mile on the completed line will be $6,951.

They arrive at this figure by using the following facts and assumptions: They figure that there will be 4,593,000 acres of land under cultivation, tributary to the Orient road, made up of 4,400,000 acres of territory at present tributary to the line between Wichita and Sweetwater, this strip being 16 miles wide, of which 75 per cent. is susceptible of agricultural development, from which is subtracted 15 per cent. as the area which may become tributary to the roads built in the future. This leaves 2,805,000 acres tributary to the road between Wichita and Sweetwater. They figure that there will be 408,000 acres of tillable land permanently tributary to the road between Sweetwater and San Angelo, a distance of 78 miles, and 1,380,000 acres of tillable land permanently tributary to the line between San Angelo and the Rio Grande, a distance of 304 miles. The present tillable land tributary to the road yields about one dollar an acre revenue. In estimating the gross earings the total tillable acreage that would be tributary to the computed line is assumed to be of such a nature as to yield the railways sixty cents revenue per acre, making a yearly revenue from this source of $2,755,800. Revenue from live stock shipments, they estimate, will yield $511,000; carload freight, $261,000; l.c.l. freight, $225,000; through freight traffic, $583,000; passenger traffic, $1,221,000, and mail and express revenue, $102,000, making a total of $5,659,000, or $6,951 per mile.

The estimate of revenue from cattle shipments is based on the figures furnished by H. H. Sparks, general live stock agent, who uses the present shipments and an assumption of the new business to be furnished by the completion of the line in figuring the total shipments. There will be shipped, it is estimated, 625 cars of sheep, 90 per cent. of which will go to Kansas City, and when the line is completed these shipments will increase 25 per cent., making the total shipment 780 cars. When the road is completed to the Rio Grande river it is estimated that there will be shipments of cattle amounting to 4,500 cars.

Messrs. Odell and Dickinson say that of the actual tillable acreage between Wichita and Sweetwater, only 800,000 acres, or 25 per cent., are as yet under civilization, and the estimates made are based on earnings and traffic derived from this acreage. For the purpose of handling the traffic from this 800,000 acres, there have been built along the line of the railway, among other industries, 37 grain elevators, 10 standard flour mills, with an aggregate capacity of 3,000 barrels per day, and 53 cotton gins for handling raw cotton, extracting the seed and temporarily baling the cotton for compress. The average yield of one dollar per acre of revenue to the railway was in a time of a severe drought, and while the country, as a whole, was suffering from the effects of the panic.

The Kansas City, Mexico & Orient shortens the distance from San Angelo, which is the distributing point for a territory extending 150 miles west and southwest to Kansas City, by 240 miles. The report says: "The estimated earnings per mile of road in the United States (excluding the Del Rio line) of $6,551 is the result of a most thorough investigation, and we (Messrs. Odell and Dickinson) are willing to assume the responsibility for the statement. In round figures we will call it $7,000, and take the distance from Kansas City to the Rio Grande as 1,022 miles, making gross earnings of $7,154,000. In determining what the net earnings should be we are willing to say 33⅓ per cent. of the gross, provided, however, that the road is equipped with all necessary facilities for the prompt and economical handling of the traffic; otherwise no safe estimate can be made. Therefore, under the conditions of a completed road in all its details the net earnings will be $2,384,666, which is in excess of the interest on the bonded debt of the entire road between Kansas City and Topolobampo."

Of the total distance in Mexico, 242 miles are in operation, as follows: East of Chihuahua, 87 miles; west of Minaca, 77 miles, and east of Topolobampo, 78 miles. In addition, the company has working agreements with the Chihuahua & Pacific to operate over the line from Chihuahua to Minaca, 126 miles, making a total operated mileage of 368 miles.

Of the country to be traversed by the completed road, that from the Rio Grande to Chihuahua, 166 miles, is largely undeveloped and is devoted principally to stock raising. Small tracts are irrigated and are very productive, and there is a large area in the Conchos river and Rio Grande valleys favorably located for irrigation. The recently built smelter of the American Smelter & Refining Co. at Chihuahua has a capacity of 1,000 tons of ore per day.

From Minaca, the western terminus of the Chihuahua & Pacific, for 200 miles west there is a heavy growth of white pine timber. There are also a number of mines in this section, some of which were in operation at the time of Cortez. From the end of the timber belt to the western slope of the Sierra Madre mountains there are a number of cattle ranges, and in the foot hills there are deposits of anthracite and bituminous coal. The western slope of the mountains produces oranges, lemons, bananas, sugar cane, etc.

The harbor of Topolobampo was said by Admiral Dewey, in his report of 1876, to be the best on the west coast of North America south of San Francisco. The deepwater roadstead has 3½ square miles of area that is protected by high hills. The railway company has been granted a large part of the water front, and a contract has been made with the Hamburg-American Steamship Co. for service from Aopolobampo to Asiatic and South American countries. The Orient road will form the shortest line from the Missouri river to the Pacific coast, and through its connection with Mexican railways it will form a line from Kansas City to the city of Mexico equal in length to the shortest line now in operation.

The chief engineer and the freight traffic manager were asked to make an estimate of the probable earnings of the projected line in Mexico. As a basis for this estimate they assume that there will be 600,000 acres of tillable land tributary to the line from the Rio Grande to Chihuahua. The production of 10 bushels to the acre on this land would contribute an annual revenue of sixty cents per acre, or $360,000. Products of mines, it is assumed, will furnish 6,000 carloads per year, and at $40 per car this would equal $240,000; shipments of cattle are estimated at 300 cars at $20 per car, making $6,000; l.c.l. shipments are estimated at 730 cars at $75 per car, or $54,750, and passenger and mail and express earnings are taken at $99,000. Basedon these estimates the total earnings on the line between the Rio Grande and Chihuahua would be $759,750, or an average of $4,577 per mile.

Near the point where the railway crosses the Rio Grande there are deposits of bituminous coal, but in the above estimate earnings from this source are not included. On the line west of Minaca extending 200 miles to Topolobampo, the engineer and traffic manager estimate that there will be 1,380,000 acres of tillable land tributary to the road. This land, it is estimated, will contribute fifty cents an acre in revenue to the railway, making $690,000. It is figured that there will be annual shipments of 7,000 cars of lumber, 3,000 cars of ties and 700 cars of firewood, which would yield the railway $227,000 from the movement of forest products. Mine products, it is assumed, will furnish 4,500 cars of traffic, the revenue from which will amount to $337,500; l.c.l. shipments will furnish $72,000, and passenger, mail and express shipments, $207,000.

This makes total estimated earnings on the line from Minaca to Topolobampo of $1,583,500, or $4,590 per mile.

Messrs. Dickinson and Odell point out that cotton shipments from the south and southwest to China and Japan aggregate approximately 600,000 bales per year, the traffic moving through San Francisco and Seattle, a mean distance by rail of 3,321 miles, from the cotton growing centers. The mean distance from the same territory to Topolobampo when the Orient road is completed will be 1,321 miles, which reduces the rail haul by 2,000 miles and increases the water haul by 1,300 miles.

In a letter commenting on the report of Messrs. Dickinson and Odell, John F. Wallace, vice-president of the Kansas City, Mexico & Orient, says that while reference is made to the quality and abundant quantity of both anthracite and bituminous coal available to the road, no specific credit is given this source of future revenue in the estimate of earnings. This coal, Mr. Wallace says, will not only move northward into Texas, but will find a large market through the connecting railways of Mexico. In Mr. Wallace's opinion, one of the most important features of the road is the location of the western terminus at the port of Topolobampo. The ability of the Orient to furnish coal at this point, which is but little out of the way of the shortest sailing route between Panama and San Francisco and the East, for less than one-half the cost of coaling vessels at Panama or Colon causes the port to be the necessary place of call for all vessels engaged in the Orient trade or between Panama and San Francisco.

TRANSPORTATION AND TRAFFIC IN GERMANY.

BY LOGAN G. MC PHERSON,
Traffic Expert with National Waterways Commission in Europe.

II.

The close of the Franco-Prussian war was coincident with that development of the western grain fields of the United States and the lowering of the transportation charges therefrom which permitted American grain to supply the needs of western Prussia, thereby facilitating the development of manufacturing to which western Prussia was forced by the depression of the landed interests. This impulse towards manufacture was stimulated by the ease of the money markets, caused by the indemnity obtained from France. The principal coal fields of Germany, as well as the ore beds, are in or near the valley of the Rhine, this contiguity of the sources of raw material to established water transportation naturally leading to the establishment and development of the great iron and steel plants along the Rhine and in its vicinity. As the necessity has arisen from the importation of ore from Spain and Sweden, it naturally follows the water course up the Rhine, and the products for export naturally go down the Rhine to the seaports. As other manufactures developed it was but natural that the abundance of coal and of developed means of water transportation should attract them also to the valley of the Rhine. This tendency has continued until at this time considerably more than 60 per cent. of the manufactures of the Empire are produced in this region, which offers a peculiar and felicitous combination of advantage that is almost, if not quite, without parallel. It even seems probable that the future development of the Krupp works will be at the new plants on the Rhine rather than at Essen. This drawing of the people to the neighborhood of the Rhine has caused a vastly greater density of population than in the interior and a far greater appreciation in the value of the land. The attraction of the valleys of the other rivers is not so marked, none of them offering the same economic advantages as the Rhine, and therefore their traffic is much less. Perhaps one-half of the Rhine traffic is of imports and exports and one-half is local. That which is local is principally of the heavy and less valuable commodities—coal, stone, cement and wood.

It is as though the state of New York were an independent nation, the Hudson river navigated by lines of steamboats plying between Albany and Philadelphia, Boston and other ports of likewise independent nations, with whom railway communication were not in an advanced state of development; and, furthermore, as though coal fields and beds of ore were in the vicinity of Newburgh and Poughkeepsie. Under such conditions these towns would become great centers of iron and steel and other manufacture and the Hudson would be freighted with barges carrying coal to West Point, Albany, Troy and to the city of New York.

Manufactured products, the commodities of all kinds that are high in value and low in weight, are chiefly carried by the railways, the transportation of such commodities by water being almost altogether confined to those conveyed between river port and seaport. The railways also carry heavy commodities even in direct competition with the waterways, not only for short distances but for considerable distances. For example, between the Westphalian coal mines and Frankfort the Rhine and the railways are approximately parallel. In 1907 of this coal traffic the railways carried 128,799 tons and the river 450,788 tons. That is, notwithstanding the cheap, heavy, and low-grade character of the freight and the radically lower rates by river, the rail lines carry over a fifth of the traffic. When there is a cessation, because of ice during the winter or low water during the summer, the railways carry the heavy freight that normally goes by water. This happens even in the valley of the Rhine, that river often being frozen or obstructed with ice for a few weeks in the winter and its navigation impaired from drought for a few weeks of the summer.

As the great iron and steel plants are centralized in the lower Rhine district, their products to the extent that they are distributed throughout the empire by rail move on the kilometric basis of rates which does not need to be modified because of the competition of any other producing center, a heavy protective tariff standing in the way of imports. Upon the raw materials used in the making of iron and upon crude iron products the manufacturers of different districts have sought and obtained concessions in rates that serve a purpose similar to that attained in the United States, where the railways have so adjusted their rates that the total transportation charge to the furnaces of different districts on their raw materials is approximately the same.

The imported grain and grain products that come through the northern ports are distributed throughout the manufacturing districts without competition other than arises from the farms in lower Germany, whose product, however, is mostly consumed in the regions where it is grown. The surplus grain from the agrarian region of the East finds its markets in the West to the limit of production. The movement of grain for the supply of the empire is therefore adjusted on a kilometric basis of rates which are not modified because of the competition of grain-producing regions, although at times different districts have sought readjustment in their respective interests. In 1891 reduction was made in the grain rates from eastern Prussia to the Rhine provinces, but the farmers and millers of the western German states brought such vigorous opposition to bear in the Reichstag and the Bundersrath that the reduction was annulled. Grain and flour once moved at the same rates, but upon complaint of the smaller millers that because of the waste from the grain they were at a disadvantage flour was advanced to a higher class.

Beef from North and South America and hams and other pork products come in through the North sea ports and are readily distributed on a kilometric basis. Their market is, however, principally in the manufacturing districts, the people of the interior using little meat other than that grown on the farms and killed in local slaughter-houses.

"AUSNAHME" TARIFFS APPLY ON FERTILIZERS.

Live stock moves from the country to the larger cities, where

it is killed and used for local consumption, there being no great outbound movement of dressed meat as in the United States. "Ausnahme" tariffs are, however, made for breeding animals and for animals carried to grazing grounds. Poultry, principally geese, come largely from Russia and readily move on the kilometric basis, being marketed without competition other than that arising from the geese grown by the German peasants, which find a ready sale.

The great bulk of the fruits and vegetables used in Germany are grown near the places of consumption. Of late years, however, the movement has increased of vegetables from Holland, where the alluvial lands are particularly adapted for their growth, and from France, whence also come peaches and artichokes. The latter, however, are still luxuries consumed principally in the great centers of the population and in the manufacturing districts. Oranges come from Italy and are being more widely distributed year by year, even in the smaller towns, where although the standard of living is far below that of the great centers and the manufacturing districts, the variety of food consumed by even the lower strata of the population has radically increased in the last 20 years.

There are practically no virgin forests in the Empire. The governments of most of the states long ago decreed that for each tree cut down on public lands a new tree be planted. The owners of private forests have followed this custom, and it is these replanted forests that now supply the lumber of local production which is largely used as props in the mines. Wood is not a considerable factor in the construction of the buildings, which are mostly made of stones, brick and concrete. The lumber, of which furniture is made, comes into Germany through the Baltic ports and the North sea ports, the logs being taken by water to Berlin, Magdeburg, Cologne, Frankfort and other cities, where furniture is made and distributed throughout the area tributary to each place of manufacture, there being no occasion to adjust railway rates in order that competing manufacturers may meet in rival markets. It is likewise with the manufacture of cotton goods from cotton that comes from the North sea ports and goes to the mills of Saxony and the East as well as those of the West.

There are coalfields in the Southeast as well as in the West and Southwest, but they are practically equi-distant from Berlin and other great coal-consuming centers, there being no necessity therefore for any particular adjustment of coal rates in order that competing mines may sell their products in rival markets. In the past the operators of different coalfields have endeavored to obtain concessions in order to extend their markets, but their applications have been declined. A reduction from the normal basis is, however, made on coal from the Westphalian mines to the North sea lowlands in order that it may there compete with sea-borne coal from England. At certain places reduced rates are made for coal moving in train loads.

A comparison of the water system and the rail system of transportation must take into consideration other factors than those which bear directly upon transportation. It must be remembered that a large proportion of the expenditure on the German waterways contributes not only to the facility of transportation, but to the reclamation of land, to irrigation, and to the prevention of inundation. Some of the canals, such as the Main-Danube—which is of small capacity and has been outstripped by the railways—have always shown a deficit which in the absence of adequate information it is impossible to apportion among the different functions for which the expenditure was incurred. Other canals that in earlier years produced a large profit now make no more than a respectable living. At Berlin they are still quite profitable. This city is situated on the Spree and around it from one point on the river to another have been built canals in order that freight not destined for or originating in Berlin may pass around instead of going through the city. Berlin is a center of production of high grade manufactures in which are engaged workmen of high intelligence and in which the transportation charge is not a controlling factor either as to the location of the industry or the markets. Such manufactures are therefore readily distributed on a kilometric basis. Manufacturers say, however, that a system of low through rates for large quantities such as exists in the United States would facilitate the keeping of stocks at various distributing centers other than the place of manufacture.

A crucial point of advantage possessed by the waterways in their competition with the railways is that their rates are subject to no sort of government regulation. The water craft pay small tolls for the use of the artificial waterways, that is, the canals, but they do not for the use of the natural waterways, that is, the rivers. These water craft charge what is necessary to secure traffic under commercial conditions, that is, what the traffic will bear, and what is necessary to secure traffic in competition with each other. On one or two of the rivers to the East, where the water traffic is not of large volume, the owners of the boats have been enabled to effect agreements for the maintenance of rates which, however, are never held at a point that yields very much profit. On the Rhine where a multitude of owners ply boats of one kind and another, it does not seem that such agreements can be made effective for any extended periods. Here the competition between the water craft frequently reduces the carrying charge to the basis of bare existence, to what the Germans designate the "self-costs." It is different with the railways, which are obliged to observe the prescribed rates. Under these conditions it is especially significant that in competition with the Rhine the rail lines carry over one-fifth of the coal from the Westphalian mines to the city of Frankfort.

It is held that certain traffic that now moves down a river to the North or the Baltic sea and that is transshipped along the sea to the mouth of another river and thence inland would go by a more direct water route across the Empire if the waterways were more thoroughly extended. Plans have been prepared for a network of canals to further such direct shipment and to facilitate distribution between the places of production and the places of consumption. The carrying out of these plans has been deferred because of the contention that further large expenditure should not be made on the waterways until the natural waterways are made productive of revenue to the governments, that is, until tolls are charged on the rivers as well as on the canals. To this end an amendment of the constitution will be necessary. This will mean a radical change of policy, as it has heretofore been traditional in Germany as in other lands to improve the bays, harbors and rivers, that is, the natural waterways, and to maintain them as national highways, free of toll from water craft. The proposed vast expenditure for the construction of artificial waterways, that is, canals, has also raised the question, over which there has been such controversy, as to whether the nation is justified in expending revenue that comes from the taxpayers as a whole for a purpose that is of particular benefit to a limited region only, that is, to the particular district immediately served by a canal. The tremendous advance of the valley of the Rhine and the far less developed condition of the interior give especial point to this contention.

In estimating the amount of traffic that is likely to come to a proposed canal, and the probable pecuniary return therefrom, a map is made of the "sphere of influence" from which the canal will draw the traffic. Such maps of "spheres of influence" are also made for existing canals, it being possible because of the rigidity of the rail rates to draw a fairly distinct line between traffic that will go by water and that which will go entirely by rail.

Traffic that is destined from a place of shipment contiguous to a river to a distant place of destination also contiguous to that river is frequently hauled by rail to the river, unloaded from the train, loaded on river craft, again unloaded from the river craft and loaded on a train for destination. When

a place of shipment and the destination are farther from a river, it becomes a question as to which is preferable—the triple haul with double transfer or through haul by rail. The policy of the government, however, is to foster the waterways as freight carriers. This is shown by the fact that railways serving manufacturing cities, such as Chemnitz, which is not located directly on a waterway, are obliged to serve simply as means of communication between such cities and the nearest waterways, that is, as branches or feeders of the waterways.

The fact that the water craft are allowed to charge what the traffic will bear, while the railways are held up to fixed and established rates is, of course, a large factor in accounting for the circuitous routes by water, over which traffic is sometimes shipped. To take an extreme example, Heilbronn in Wurtemberg transported a considerable quantity of soda to Tetschen in Bohemia. It was sent by the Neckar to Mannheim and there loaded on a Rhine boat which took it to Rotterdam, whence it was transferred to another vessel which took it to Hamburg, where it was transferred to a boat which took it up the Elbe to Tetschen, the cost of transportation over this roundabout route being less than by rail over the comparatively short distance from Heilbronn to Tetschen direct.

A consideration of prime importance in the governmental control of the railways has not been without influence in the proposals to extend the canals. It is claimed that a complete network of waterways would facilitate the movement of troops and provide means for the conveyance of wounded to hospitals in time of war. Every two years the government asks the owners how many river craft they could place at its disposal in case of war. It is obvious, however, that for the mobilization of troops the waterways can never equal the railways, as they do not afford means for such rapid despatch or distribution in as varied directions. The adaptability of the railways for military purposes was quickly perceived by the government. In 1850 it built a railway for military purposes and after the general purchases of the Prussian railways by the state many extensions were made principally on the same account. That political and national considerations have limited the extension and the possibilities of the service of the railways is demonstrated by the fact that they have been built out to the national boundaries and then their lines have been turned and run along the boundary with little or no consideration for the possibility of developing traffic with other countries. There is at present international communication over comparatively few routes.

One argument advanced for the extension of the German waterways is that railways, especially those in the valley of the Rhine, have reached the limit of their development. This is an amazng statement to anyone familiar with the great American railways that are laid with rails weighing 100 lbs. to the yard, over which pass locomotives weighing 200 tons and over, hauling trains that with their loads weigh in some cases over 7,000 tons. In Germany until within twenty years the freight cars were principally for loads not exceeding 10 tons. Many are now in use carrying 20 tons and the larger manufacturers are demanding still larger cars. One of the foremost of German manufacturers, when in the United States about ten years ago, was shown the great steel cars with a capacity of 40 and 50 tons and asked why he did not introduce such cars into Germany. Upon his return he put the matter before the then railway minister in an andeavor to have the government enter into the use of steel cars with a capacity of even no more than 25 or 30 tons. The minister had formerly been in the employ of the manufacturer and between them were such cordial relations as to assure sincere utterance. The minister said that only the larger shippers could make use of such large cars, that to include them in the equipment would therefore give to large shippers an advantage over small shippers which would, of course, be a discrimination that could not be tolerated. The obvious deduction from this quite accords with the fact that the manufacturers and other shippers of Germany as a rule receive and forward freight in small quantities. This is especially the case in the interior not served by waterways, where the prosecution of house industries is still conspicuous and other manufactures are on a small scale. The ministry, however, points to the fact, that the introduction of the twenty-ton cars has brought the average capacity of the cars in use to almost fifteen tons and claims that this average advance is quite adequate to the average needs of the average advance in industry, stating that a progressive gradual advance is preferable to the industrial dislocation that follows radical and sudden displacement of industrial instruments. The ministry is also not convinced of the economy that would follow the use of larger cars, it being its opinion that, for example, the dead weight in one 40-ton car is not greatly less than that in two 20-ton cars. But notwithstanding all this, as the manufacturing plants increase in size and number, the demand for larger cars must necessarily be more urgent, and the government in the end will undoubtedly be obliged to re-equip and to rebuild the railways, that they may be equal to the demands of traffic that will be conducted on a larger scale. It is significant that two or three of the great manufacturing plants, such as Thysen in northwestern Germany, have their own interior railways connecting their mines and mills and the entire plant with the contiguous waterway, and that over these private railways are run powerful locomotives and freight cars wth a capacity of 40 to 50 tons; that is, a few of the manufacturing establishments have found it economical to adopt the American practice on their private lines. At present, however, with but few exceptions, the mills and factories do not consume raw material in such vast quantties or turn out finished products in such great volume as those of America, the plants not only being not so large, but being not keyed up to so swift a pace.

The great manufacturers admit that canals would not meet the requiremeuts of the American plants, because of this higher development demanding the pouring in of vast quanti ties of raw material and the regular taking away to all points of the compass of manufactured products in great volume. It is impossible to conceive of a great American factory such as those which make textiles and boots and shoes in New England, steel in Pittsburgh, furniture in Chicago, or flour in Minneapolis, being content to remain idle at times of great demand for their products, because of interruptions to navigation. Their costs of manufacture are so closely calculated that they would not moreover be willing to pay radically higher rates by rail than are in effect over the waterways during the period of navigation.

The truth is that because of the traditional fostering of the waterways and also because the government desires to reap as large a net return as possible from the operation of the railways, the possibility of the development of these railways to a standard af efficiency, even approximating that of those of the United States, has practically not received consideration. Notwithstanding, it is admitted by those whose judgment is beyond dispute, that were German railways equipped with locomotives and cars of the great capacity of those in the United States, the cost of hauling by rail in Germany could be so materially reduced as to greatly diminish the present sphere of influence of the waterways. It is also admitted that such development of the railways would lead to the location of certain manufacturing plants at places of greater economic advantage to and from which traffic would move by direct lines, avoiding the shipping, reshipping and transportation by water. The complaints as to railway freight rates and railway facilities in Germany, therefore, come principally from the great and enterprising manufacturers who want to push ahead on a large scale. This is in contrast with the situation in the United States, where under private control the railway rates and railway facilities have been developed to meet the needs

of the great industrial and commercial corporations and where the complaints against the railways have come in larger numbers from the smaller shippers—the men who have not adjusted their business to the changing economic current and are being worsted in the struggle.

That the German government utilizes the net revenue of the railways in its general budget is well known. That is, the income of the railways helps to pay for the support of the educational establishment and other expenditures for which the state is responsible, one-fifth or more of the needs of Prussia being supplied by the profits from railway traffic. The Minister of Public Works reports to the Finance Minister as to all matters of importance affecting either the revenue or the expenditures of the railways. A railway minister once said that it gave him much pleasure to realize that his was the only department of the government in which economies could be effected for the benefit of the national revenue; that the other branches only spent money, while his department made money. The state also receives an income from its lands, forests and mines and other industrial enterprises in which it is engaged, but this is much smaller than its revenue from the railways. The railway minister goes over the annual budget of the railways with the finance minister, and then the finance minister reports the budget to the house of deputies, which votes the annual appropriation for the railway expenditure. In 1907 the railways wanted 350 million marks, but the deputies voted 300 million. Business men claim, but the ministry does not admit, that these processes of appropriation very effectually prevent broad gage expenditure for the purpose of unusual development for the trying of experiments that might seem likely to lead to considerable economies in expediting movement or improving practice.

The operation of the railways of the various states of the German Empire is, in a measure, co-ordinated through the "Bundesrath," a union of representatives of the various states. This is the authority responsible for the regulations in connection with construction and working and traffic that concern the empire as a whole. It has an executive office in Berlin designated the "Reichs-Eisenbahn-Amt."

There is also a "general conference" of the whole of the railways of the German Empire which is convened by the Prussian Minister of Public Works usually once a year. It is assisted by a "standing tariff commission," which is composed of representatives of the different railway administration and directions, and also of representatives of agriculture, industry and commerce.

The official head of the Prussian State Railways is the Minister of Public Works, who is appointed directly by the King. He is the railway minister, and also has charge of the waterways, which are administered by a subordinate department through an officer reporting to him. The administration of the railways is centralized in the department of public works at Berlin, where five officers are respectively in charge of construction, machinery, traffic, finance and general administration.

The immediate conduct of the Prussian railways is through divisions entitled directions, of which there are 21. Each of these is in charge of a president of the direction, under whom are direction officers, respectively, in charge of various phases of the direction conduct. Each of these reports directly to the president of the direction, who communicates in regard to important matters with the respective officers at Berlin, who report to the railway minister.

In connection with each direction is an advisory council, upon which are representatives of agriculture and commerce, and there is a general advisory council for the assistance of the minister, to whom all important questions are referred. The system of advisory councils is an institution in which Germany has much pride. Proposals for the modification of railway tariffs are made to these councils and very thoroughly deliberated upon and discussed by them before their recommendations are made. They have no authority, but their conclusions have great weight with the railway administration. Their avowed purpose when counseling a change in a rate is not to give any shipper or one district an advantage over another, but to promote the development of the nation. They are, of course, powerless to effect any radical and general rate reduction and increase of rates are very few, a rate once established being usually permanent. A reduced rate may become effective at once, but six weeks' published notice must be given of an advance.

It is especially significant that the government has not developed any such statistical system as that now regarded as an absolute necessity by the great railway systems of the United States, through which can be ascertained the efficiency of each division or subdivision of railway line and the comparative cost per unit of maintenance and of operation.

The budget of a direction consists simply of its total revenue and its total expenditure. The absence of information as to the comparative efficiency of a different line and of different directions is part of the policy of the general administration. It does not wish the people of the empire to know how the kilometric system of rates works out in large returns to the railways of the districts with large traffic and small returns to the railways of the districts with sparse traffic, it being feared that the people, if they had this information, would demand a reduction of rates in the districts of dense traffic.

A comparison of the volume of traffic carried respectively by the railways and the waterways is furnished by the following statistics. It is interesting in the first place to note the comparative extension in length. In 1875 there were in Germany 6,214 miles of navigable waterways and 16,467 miles of railways, in 1885 6,214 miles of waterways and 22,992 miles of railways; in 1905, 6,214 miles of waterways and 33,804 miles of railways; that is, the length of the railways has doubled in thirty years, while the length of available waterways has remained stationary. The aggregate length of these waterways is now stated in the government reports as about 8,700 miles. It is upon the highest official authority, however, that the statement is made that there are available for navigation but about 6,200 miles. This is because the length of new canals that have been built from time to time has been counterbalanced by the fall of old canals into desuetude, either because railways have outdistanced them or because their traffic has so dwindled that their maintenance has not been worth while.

In 1882 there were 18,715 canal and river boats, with a capacity of 1,700,000 tons; in 1907, 26,235 boats, with a capacity of 6,900,000 tons. In 1882 there were in Prussia 90,610 freight cars, with a capacity of about 900,000 tons; in 1907, 382,185, with a capacity of about 5,100,000 tons. Larger boats have been built for use on the same waterways, while a vastly greater number of cars have been built for use on double the length of railway. Of the 382,185 freight cars in use in Prussia 35.8 per cent. have a capacity of ten tons, 60.7 per cent. a capacity of 15 tons, and 3.5 per cent. a capacity of 20 tons.

The total traffic measured by tons carried is as follows:

Rail.	1885.	1905.
Import	8,000,000	27,000,000
Export	13,000,000	33,000,000
Local	87,000,000	254,000,000
From one country to another, passing through Germany	2,000,000	5,000,000
Total	110,000,000	319,000,000
Water.		
Import	6,500,000	20,000,000
Export	3,500,000	11,000,000
Local	7,000,000	21,000,000
Total	17,000,000	52,000,000

The total traffic measured by ton-miles is as follows:

	1885.	1905.
Rail	10,315,240,000	27,341,600,000
Water	27,838,720,000	9,321,000,000

That is, although if the traffic of 1905 be measured by ton-miles it would seem that the waterways carry one-fourth of the freight, in reality they carry but about one-seventh of the total mass of freight. This is because the longer haul of

the freight on the waterways, the far more circuitous haul, gives a greater volume of ton-miles than the haul by railway, which is usually over a route that is approximately direct. Although the capacity of the freight cars is substantially the same as that of the water craft, they carry seven times as much freight.

The ton-miles per mile; that is, the density, are as follows:

	1885.	1905.
Rail	278,387	508,926
Water	298,272	1,118,520

The greater density by water than by rail is a natural consequence of the greater volume of traffic on the rivers that are practically estuaries of the North and the Baltic seas, the Rhine carrying in 1905 43 per cent. and the Elbe 24 per cent. of the entire inland water traffic. Its greater ratio of increase follows from the increased volume of traffic over a length of waterway that has remained constant for thirty years, while in that time the length of the railways has doubled, the scant traffic of the sparsely settled regions bringing down the average of the rail density. It would be interesting to know what is the density of the traffic of the railways in the Rhine region, but this the statistics do not show. It will be perceived that this comparison has taken no account of the passenger traffic which moves in great volume upon the railways, but is negligible by water except upon the Rhine, where the greater proportion is of the tourists.

The total capital expenditure of Prussia on its rivers, canalized rivers and canals to 1905 amounts to $132,500,000. The expenditure in improving its rivers has averaged over $30,000 per mile, the average on the Rhine over $60,000 per mile; the expenditure on the canalized rivers and canals has averaged over $40,000 per mile. The total expenditure of Prussia on the maintenance of its interior waterways in 1905 was over $4,000,000; its total receipts in that year from these interior waterways—that is, the rivers, canalized rivers and canals—was about $1,700,000. That is, the revenue from the interior waterways in 1905 was over $2,300,000 less than the expense for maintenance. If thereto be added interest charge on the capital at 3½ per cent., amounting to $4,637,750, it is found that the charge borne without offset by the state of Prussia during 1905 for its interior waterways amounted to nearly $6,500,000.

The capital expenditure on the Prussian railways to 1905 was $2,286,000,000. The receipts for 1905 were $432,315,000, the expenses $262,075,000, leaving a surplus of $170,240,000, equivalent to nearly 7½ per cent. on the capital.

The results of the survey that have been embodied in this report and the official statistics set forth in the immediately preceding paragraphs demonstrate that, notwithstanding that the waterways are the traditional thoroughfares of Germany, notwithstanding the fostering care that the government has bestowed upon them, notwithstanding that the water craft are exempt from tolls on the natural waterways and pay even on the canals tolls not nearly sufficient to cover the cost of maintenance and interest on the invested capital, and are allowed to make such charges for transportation as they please, notwithstanding that the Emperor so strongly favors waterways that railway and other officials of Prussia who have publicly opposed a forward canal policy have been made to suffer for their temerity, these inland waterways of Germany are lagging behind in the race with the railways, inferior in their carrying capacity as these railways are to those of the United States. Were this not so, why should the length of the waterways have remained constant for thirty years while the length of the railways has doubled? Why should not canals have been built instead of railways? That the Rhine and the other rivers which are practically estuaries of the sea, penetrating regions of developed traffic, are, and will remain, useful instruments of transportation is beyond question. But this is because they are estuaries and because they penetrate such regions and not because of the intrinsic superiority of waterways for inland traffic.

There are not lacking great and progressive business men of Germany who say that the canals have outlived their usefulness. That no such admission is made in the Department of Public Works is to be expected. These progressive business men say that in the future the empire must rely more and more upon its railways; that larger locomotives and larger cars must be introduced, and that electricity must be used to a greater extent.

The comparison of the freight rate structure of Germany with that of the United States has already disclosed some radical points of difference. To say that the modification of either system along the lines of the other would inure to the advantage of the industry and commerce of either country would be to make a statement that would be too sweeping unless fortified by a thorough analysis. It is safe to say, however, that the freight classifications of Germany are not so pliant as those of the United States, and the German officials admit that on the whole their freight rates are higher. This is upon a money equivalent. Were the comparison to take account of the lower standard of prices and wages in Germany the disparity in favor of the United States would be far greater.

The German system of freight rates has one effect which has been indicated, but upon which greater stress must be placed. It prevents the growth of distributing centers in the interior of the empire, making the seaports and the manufacturing centers the sources whence supplies are shipped directly to the retail dealer at the place of consumption. In a country where the greatest practical rail distance is less than a thousand miles, and where a great proportion of the manufactures in pursuance to the old-time custom are still made in the different towns for local distribution, this system doubtless does not impede traffic to the extent that it would in the United States, over which a rapidly spreading population, without hindrance from customs duties between one state and another and without commercial rivalry other than that which springs from a desire to increase production and distribution, has developed a transportation system which permits the materials and products of one region to be carried to markets distant one or two or even three thousand miles, which permits stocks of goods to be held at distributing centers every two or three hundred miles wherefrom a local dealer can replenish his stores at short notice, thereby being enabled to offer to his customers merchandise in variety and quantity unknown to the German interior.

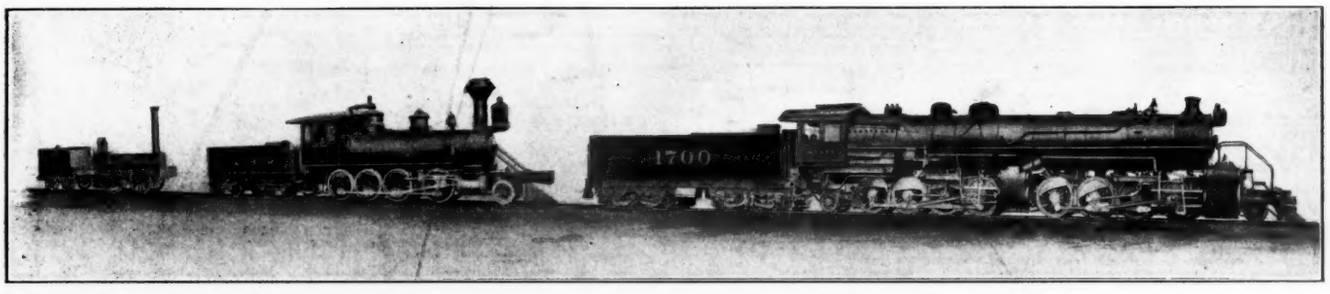
It follows from the state ownership, the state monopoly of the German railways, that there are no traffic solicitors, either passenger or freight, such as are an expensive adjunct to the railways of the United States. Since rebates, cut rates and other discriminations have been abolished in the United States the principal function of the freight solicifors has been to place their detailed knowledge of transportation at the service of shippers to figure out routes and rates and attend to a hundred and one details in their behalf. These are services which need to be performed in any country where agriculture, industry and commerce give rise to a large traffic, whether the transportation instruments are administered by the government or by private corporations. Notwithstanding the apparent simplicity of their foundation, the complex development of the German tariffs has made them full of intricacies. The unraveling of these and the tracing out of the direct and least expensive routes demand expert knowledge and specialized attention.

This is performed in Germany by "Spediteurs," who exist in every city and every considerable town. Their services are availed of by shippers, upon whom their fes fall, in addition to the charge of the carriers, entering therefore into the total transportation charge. These "Spediteurs" also undertake the hauling of merchandise to and from the railway stations and perform other functions of the forwarding agent such as exists in certain of the American cities.

HISTORY OF THE BALDWIN LOCOMOTIVE WORKS.

The incorporation of the Baldwin Locomotive Works, taking effect July 1, 1909, marks the passing of one of the largest private firms in America. Measured by the number of employees, it was probably the largest. The public, generally, has long supposed that the Baldwin Locomotive Works was an incorporated company, but such was not the case until the date given above. Individual or firm ownership was the fact for seventy-eight years of its existence. Some account of the men who created and managed the works during that period may, therefore, be of interest.

Matthias W. Baldwin, the founder of the works, cannot properly be said to have deliberately planned the establishment of a locomotive works, but was led into it by circumstances. He was by trade a manufacturing jeweler, but in 1825 went into the manufacture of book-binders' tools and cylinders for calico printing. He was an ingenious mechanic, and having designed and built a stationary engine for his own use, was led to take orders for stationary engines as a part of his business. Thus he became known as an expert in steam engineering, and when, in 1829-1830, locomotives began to be in demand, Mr. Baldwin was called upon to design and construct such machines. His first locomotive for regular railway service was the "Old Ironsides" ordered by the Philadelphia, Germantown & Norristown Railroad Company in 1831, and tried on the line November 23, 1832. Other orders followed, and by 1834 Mr. Baldwin was fully committed to the manufacture of locomotives as his main business. In 1835 he moved his shop to the present location at Broad and Spring Garden streets, where a building had been erected with especial reference to the construction of locomotives.



1832. 1876. 1909.

These Photographs, Grouped to Scale, Show the Progress of 77 Years.

In April, 1839, Mr. Baldwin associated with himself, Messrs. George Hufty and George Vail, under the firm name of Baldwin, Vail and Hufty.

George Vail was the son of Stephen Vail, the founder of the Speedwell Iron Works, at Speedwell, N. J., which company built the first steam engine that propelled a vessel across the Atlantic. George Vail was a member of Congress, and about 1860, went to Glasgow as American Consul. He was a brother of Alfred Vail of telegraph fame.

George Hufty had been an employee of Mr. Baldwin and had been superintendent up to the time of his admission to partnership.

In 1841 Mr. Hufty withdrew and the partnership continued as Baldwin and Vail until 1842, when Mr. Vail also withdrew. Mr. Asa Whitney became a partner and the firm of Baldwin and Whitney was constituted, continuing until 1846, when Mr. Whitney severed his connection with the business to engage in the manufacture of cast iron car wheels, establishing the firm of A. Whitney & Sons. Mr. Whitney had been the superintendent of the Mohawk & Hudson Railroad, and brought to Mr. Baldwin both railway experience and thorough business talent. After Mr. Whitney's withdrawal, Mr. Baldwin conducted the business alone until 1854, when he associated with himself, Mr. Matthew Baird, and the style of the firm was M. W. Baldwin & Co. Mr. Baird learned the trade of a coppersmith with Matthew O'Neill in Philadelphia, and afterwards in New Castle, Delaware. In 1836 he was engaged by Mr. Baldwin and given charge of the boiler, copper and tank shops.

Mr. Baldwin died September 7, 1866, and the business was bought by Mr. Baird, Charles T. Parry and George Burnham, and continued under the name of M. Baird and Company. Mr. Baldwin was remarkable, both as a mechanic and as a Christian. Having been trained to work with his own hands, he retained this habit to the last and even up to the time of his death he had a small lathe and various tools in a little room off the general office of the works, where he spent much time perfecting various mechanical devices. He was happiest when going through the works and personally inspecting the progress of locomotive construction. He was in no sense an office man or a business manager. He is credited with the statement that one hundred clerks could not make a locomotive, and this indicates his disregard of business system. He always had a man as his financial manager and such a person was absolutely necessary. It is said of him that he would go off down town without even money enough in his pocket to pay car fares.

He was a great believer in systematic beneficence and even when his business did not appear to warrant gifts, would make his note for an amount which he desired to bestow for some worthy purpose. He will long be known and remembered in Philadelphia from his work in church building. At least six churches, now large and flourishing, may be credited to his efforts and contributions, either in whole or in part.

Mr. Parry had been connected with the works for many years, having learned his trade as a pattern-maker under Mr. Baldwin. He was the superintendent when entering the firm. He was a man of exceptional mechanical ability; of most pleasing and companionable character, and was so thoroughly rational and systematic in reasoning the mechanical problems that he was familiarly called by his friends "The Philosopher."

George Burnham had been in the employ of Mr. Baldwin in the business department almost from the beginning of the business. He came to Mr. Baldwin when quite young, as a clerk in the office, and in due time was made manager of the financial department and during his active participation in the business as a partner, continued in charge of that branch of the business.

In 1870, Messrs. Edward H. Williams, William B. Henszey and Edward Longstreth were admitted to the firm.

Of Dr. Williams it may be said that he was one of the most widely known men in the railway profession up to the time of his connection with the Baldwin Locomotive Works. Educated in his native state of Vermont for the medical profession, and practising in that profession for a short time, his tastes finally led him to civil engineering and railway work, and after an initial experience on the Caughnawago Railroad of Canada he went west and was connected with the Lake Shore, and subsequently with the Chicago & North Western. Everybody knew "Doc" Williams, and he knew everybody. He would go over the line of which he was superintendent,

and could call almost every section hand by name, and remember almost everything about him up to the number of children which he probably had at home. It is safe to say that he was one of the most genial and popular men in America.

William P. Henszey had been connected with the works since March 1, 1859, as a draftsman and in charge of the drawing room, which position he occupied up to the time of his death, March 23, 1909. So recently has Mr. Henszey been taken away that his friends still retain the most vivid recollection of him and his amiable disposition. As a draftsman, he was a man of exceptional ability and taste, and it used to be said of him that he could put lines on paper faster than any other known draftsman, and whatever he did in the way of locomotive designing was in the direction of graceful lines as well as in the interest of utility. He was one of the men who, with the late William Mason, had done more than any one else to improve the locomotive in an esthetic sense.

Edward Longstreth was born in Warminster township, Bucks county, Pa., June 22, 1839, was educated at the Ercildoun Friends Boarding School and commenced his apprenticeship as machinist with M. W. Baldwin & Co. November 2, 1857; was made assistant foreman before completing his apprenticeship on September 14, 1860; was made foreman of the second floor, Hamilton street shop, May 20, 1861; foreman of erecting shop August 1, 1867; superintendent of the works January 1, 1868. He was a man of exceptional mechanical ability, and had much to do with the establishment of the system of standard gages which is characteristic of the method of manufacture of the works. He withdrew from the business in 1885, due to impaired health, and died February 24, 1905.

In 1873, Mr. Baird sold his interest in the works to his partners, and a new firm was formed under the name of Burnham, Parry, Williams & Co., to which was admitted John H. Converse, who had been in the employ of the establishment since 1870.

Messrs. W. C. Stroud, Wm. H. Morrow and William L. Austin were admitted to the firm in 1886.

Mr. Stroud had been the bookkeeper, and on entering the firm was given charge of the financial interests of the business. He died September 21, 1891.

Mr. Morrow came from the service of the Pennsylvania Railroad where he had to do with the shop accounting. He was made superintendent of the works during his connection with the firm and continued in that capacity until the time of his death which occurred February 19, 1888.

In 1896, Messrs. Samuel M. Vauclain, Alba B. Johnson and George Burnham, Jr., were admitted to the firm, the title of which was then Burnham, Williams & Co.

George Burnham, Jr., had been connected with the works for several years, and on entering the firm was given charge of the finances, in which capacity he served until his retirement, December 31, 1906.

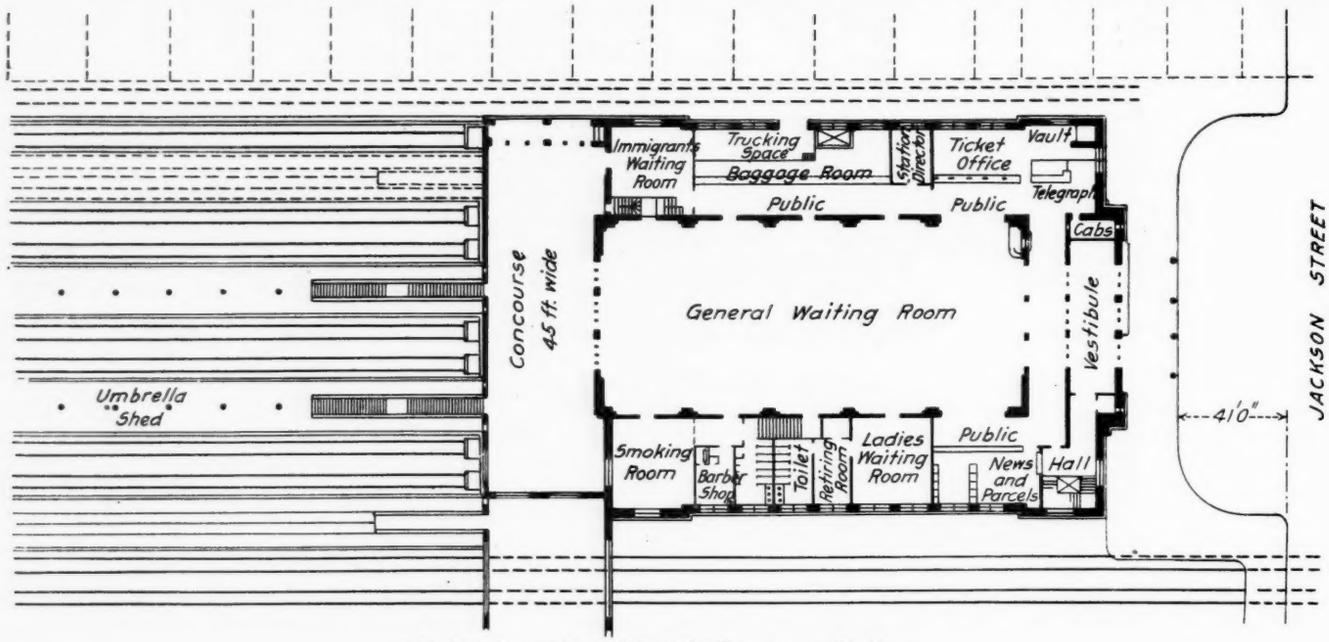
On July 1, 1909, the members of the firm transferred their interest to a corporation called Baldwin Locomotive Works, which now conducts the business under the following organization:

John H. Converse, President.
William L. Austin, Vice-President and Engineer.
Alba B. Johnson, Vice-President and Treasurer.
Samuel M. Vauclain, General Superintendent.
William de Krafft, Secretary and Assistant Treasurer.

OREGON AND WASHINGTON STATION AT SEATTLE.

The Oregon & Washington, now being built from Portland, Ore., north to Tacoma, Wash., and Seattle, has let the contract for a passenger station at Seattle, to cost about $500,000. Work is to begin at once, and it is expected the building will be completed by the time the road is ready for operation.

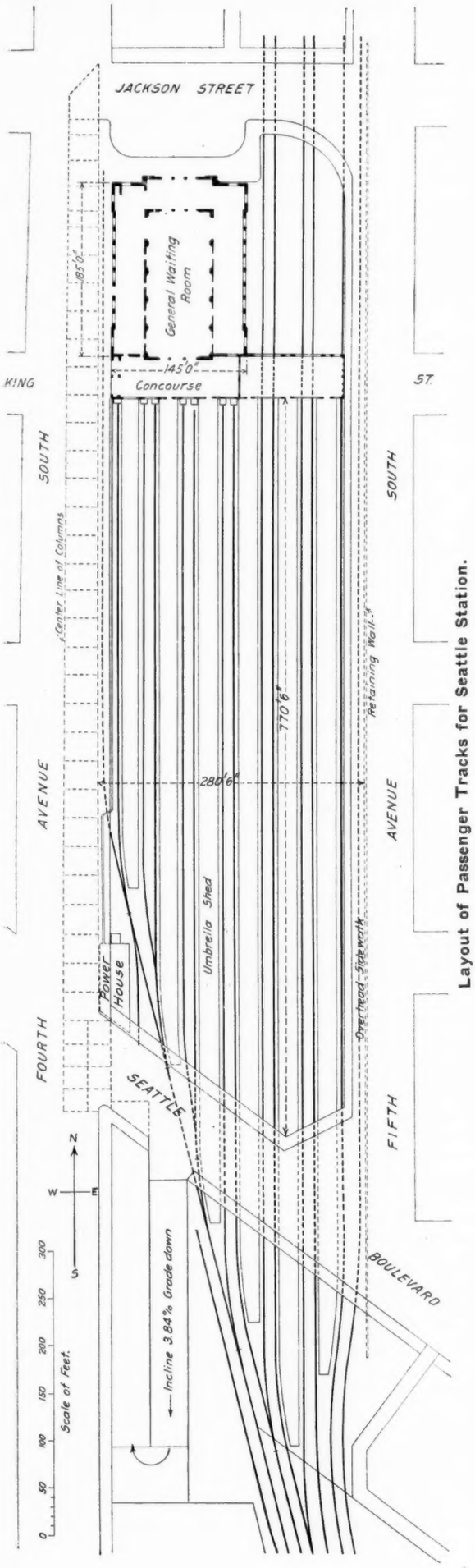
The station is between Jackson and King streets and Fourth and Fifth avenues. It fronts on Jackson street, which is to be widened to 58 ft. between curb lines to carry the increased traffic. The building line is set back 68 ft. from the streets, and 41 ft. of this distance is to be paved for a carriage stand, so that the street need not be obstructed.



Main Floor Plan of Seattle Passenger Station.

The building will have a frontage of 147 ft. on Jackson street and 185 ft. on Fourth avenue. It will have three stories above the ground line and a 24-ft. story below, the tracks being depressed to that level. The construction will be concrete and steel and the exterior walls will be finished with dark red brick and trimmed with white artificial stone. The architectural design is an adaptation of the classical style, the principal feature being the main facade overlooking Jackson street. The main entrances, which are placed in the center of this facade, are protected by a large marquise and reached by three large openings having double acting doors. The central gable is flanked by shallow pavilions and brought more into prominence by the bold projection of pilasters on either side.

The general waiting room will extend through the center the entire length of the street floor, opening through a small



Layout of Passenger Tracks for Seattle Station.

vestibule on the street in front and directly on the concourse in the rear. This room will be 74 ft. wide, with a high vaulted ceiling, tiled wainscoting and floor, and quarter-sawed oak woodwork. The electric lighting is especially designed to eliminate shadows. In general, the offices and waiting rooms are so arranged that they naturally divide travelers who are in a hurry to get to a train from those who have to wait some time in the station. On one side of the general waiting room are the telephone, telegraph and ticket offices and the outgoing baggage room, so that the traveler can transact all necessary business while moving in the same general direction from main entrance to train. On the opposite side of the waiting room will be the smoking room and barber shop, the ladies' waiting and retiring rooms, and news and parcel stands, so that travelers who are not going out at once can read, rest or smoke undisturbed by the crowd that is pushing its way to the trains. The two exceptions to this rule of arrangement are the immigrants' waiting room, adjoining the baggage room, and the dining room and kitchen on the mezzanine floor. The track level and a portion of the mezzanine floor will be given over to baggage, express and mail, elevators being provided to connect the different floors. The second and third floors contain the general offices of the company.

The following table shows the areas of the principal divisions of the station:

General waiting room	16,636 sq. ft.
Women's rooms	1,768 "
Men's rooms	1,570 "
Ticket office	1,140 "
Dining-room and kitchen	2,370 "
Baggage, mail and express	30,202 "
Sundry conveniences	10,209 "
Total	63,895 sq. ft.

The concourse in the rear of the building will be on the street level and will extend over all the tracks. It will be 45 ft. wide and, in addition to the exit from the general waiting room, will open on the streets at both ends, to allow incoming passengers to leave without passing through the station. Easy flights of steps will connect the concourse with the track level. Umbrella sheds cover the platforms, as shown in the drawings.

Reference to the accompanying plan will explain the arrangement of yards and street crossings. A 3.84 per cent. incline leads from the street on Seattle boulevard down to the track level and connects with a teaming space along the tracks built under the street. This will allow express and baggage to be transferred directly between cars and wagons, and will also allow supplies to be delivered by teams to the power house, which is located in the yards at a distance from the station.

The plans for the building were made in the office of H. J. Patterson, architect for the Harriman Lines in San Francisco, and the station will be built under the supervision of J. R. Holman, chief engineer of the Oregon & Washington, to whom we are indebted for illustrations and descriptive matter.

THE CLAIM AGENT SHOULD EDUCATE US.

BY J. F. RUSS.

Education is the greatest power that can be applied by man. Its movement and advance are irresistible. By being properly directed, education has achieved wonders. There should be a community of interest between the people and the railways. How is it? Selfishness seems to be inherent in almost all human beings. For years the people were educated by rebates and passes. During that time the "claim fever" was largely held in check. Education stopped the rebates and cut off the passes, but did not cure the people of selfishness. Not so many years ago claims against a railway company had to have merit and be supported by evidence before they would be paid. But the railways found that they could not get jus-

tice before a county jury, and this, with so much adverse and drastic legislation, led them to pay claims more freely and grant many other concessions to appease adverse agitation.

Has this course been successful? No; on the contrary these efforts to appease the people have only aggravated the disease of claim fever. Claim fever is an old disease, but by this system of education it has steadily grown worse every year, until it has become a serious malady and highly contagious; in fact, an epidemic.

The claim department always has plenty of business on hand. The number and variety of claims presented is simply appalling. Each claim paid educates not only the party who gets it paid, but every other person doing business with the railways that learns of the claim being paid, and the "fever" is being constantly spread by this means of education. No typhoid bacillus could multiply faster. In most cases the slightest pretense of responsibility, the faintest chance to get damages, augments the "fever" and develops a case. A passenger on a train learns that there is a wheel off the track. He may not know it until he finds they have made an unusual stop, but suddenly he discovers his back is injured or he has been sprained in some way. This is the course generally taken by the fever if no visible mark of injury appears.

In case of accident to a passenger train, claim department representatives meet the passengers and secure a release and settle. Mr. A. sees Mr. B. get $10 or $15 for signing a release. He knows that Mr. B. was not injured, but takes advantage of the circumstance to get a little money himself. This course of education increases the number of cases of "claim fever." Warning signs are posted in the coaches for passengers to be seated, but they will stand up in the aisle or sit on the arm of a seat, where any little jar or rough management of the air brakes upsets them, and they are immediately attacked by the "fever."

A passenger will stand up in the end of a car with hand on the door jamb; door swings shut, pinching his fingers, and the company is held responsible for his lack of common sense; and business is created for the claim department.

Passengers will go to sleep in their seats and expect to be awakened and carried out at their destination; and then if they are carried by their station they are immediately afflicted with the malady.

The farmer stacks his hay or straw near the railway and his temperature may be indicated by the distance between the stack and the right of way fence. If it burns, the hay was A-1, and the straw he usually burns each year to get it out of his way has become very necessary and valuable. If fire gets out and runs over his land, everything it touches has a high value, and the probable worth for some time to come is included in his computation of his claim. If any live stock is killed, it is almost always blooded stock with a fine pedigree.

If an accident occurs at a public road crossing or street, the claim will be particularly heavy, for in every case the fact is established that the whistle was not sounded nor bell rung.

The stock man ships a car of cattle. He is furnished transportation to look after it, but he rides in the caboose, and then holds the company responsible for the condition of the animals on arrival at destination. In the meantime the "fever" is working on him and his claim is based on rough handling, delays, shrinkage, and even on a decline in the market. If his fever is not high enough on arrival, the commission firm will increase it by kindly reminding him of his opportunity of at least getting his freight money back. And this in a branch of the business that is not nearly so profitable as it seems. The stock car has to be hauled to shipping point empty and when loaded must be rushed to market; tonnage sacrificed for time. It is hauled at a very cheap rate compared with the cost of transportation and facilities furnished.

The railways' education of the stock shipper has done great things for him. He must be furnished good pens, plenty of water, feed and water troughs, scales to buy his stock over, and have his hogs watered along the road; he must be compensated for bedding the car, which often he fails to do, apparently with a view to justifying some kind of a claim. Some of the more highly educated ones have learned to order a short car, when only large ones are available, and have it billed "short car ordered, large one furnished." This is especially true if the car is not going to run over a track scale.

An elevator man ships a car of grain and his temperature begins to rise; the fever microbe gets to work at once. When he gets returns they do not show as much grain as he figured that he loaded, and he concludes the car must have been leaking; and so he presents a claim for his alleged loss.

Many commodities are shipped in packages made of material entirely too frail to stand the handling they must receive on freight trains. By the laxness of the railway, the shipper has been educated to the point where, by using these frail boxes, he sees he can reduce the weight of his shipment and then hold the company responsible for the damage that is very likely to occur.

Eggs are shipped in cases that only by the most careful handling can be kept whole; and a very large portion of egg shippers have the fever. Claims are being paid on eggs that, so far as can be told from the package, are in perfect condition when delivered, but when the candler goes at them, he finds some cracked eggs, and presents his claim for settlement.

Every hold-up claim paid (and 90 per cent. of them are straight hold-ups) only aggravates and increases the number of cases of claim fever.

Will not more education of employees in regard to claims assist in reducing their number? Educate the car department to give more attention to the hand brakes on cars which before we had air brakes were kept in perfect condition. In switching at stations it is just as necessary to-day as it ever was to have good hand brakes; and thousands of claims are chargeable directly to poor hand brakes. Rules require their being tested before cars are cut off, but any practical man knows that this is often neglected. The trainman will look at the brake, and if it appears to be in good condition, the car is cut off; and then, too late, he finds the ratchet wheel is loose, the dog gone, or the brake rod too long; and he winds up against the staff without setting the brakes. Damage is done to contents of car and often to the car, but it is almost sure to develop a case of "claim fever."

Educate warehousemen to properly load merchandise. Educate shippers to use better and stronger packing and boxing. Educate trainmen to handle merchandise carefully. Get them to realize that every case of damage means a loss to the company. Never couple on a street crossing, nor back over one, without a man there to prevent someone getting in the way. Never go into a team track or a house track without first seeing that some fellow hasn't set his wagon in under a car while loading or unloading freight. Never go into an elevator track without first seeing that the elevator spouts are out of the way, or into a factory track without seeing that everything is clear.

Educate trainmen that extra care should be used with passengers, especially on freight trains, as they are very liable to get hurt if opportunity offers; and they are a high class of traffic to pay claims on. Educate trainmen by means of schools of instruction to be held monthly. Educate the public by only paying legitimate claims. The stock shipper needs educating in a new line badly. He at present wears fine linen and fares sumptuously everyday. Do not pay his claim unless his stock is actually damaged or seriously delayed. Raise the rate on stock and put it on a remunerative basis, considering the movement required and the light haul on the car. If he threatens to ship on the other road, let him do it; and try to get the other road to treat him in the same way. Educate all employees to be pleasant and accommodating to the public and cause the patrons to take the chips off their shoulders. No possible power can bring about these desired results but a thorough system of education.

General News Section.

Representative Mann's bill would restore to railways the privilege of exchanging transportation for newspaper advertising. If Mr. Mann ever aspires to the Presidency he is assured of the support of several thousand country editors.—*Wall Street Journal.*

Daniel Willard was given a farewell dinner in Chicago on January 13 by officers of the Chicago, Burlington & Quincy. Sixty-five officers of the road were present, including President George B. Harris and First Vice-President Darius Miller. Mr. Willard assumed his duties as president of the Baltimore & Ohio on January 14.

Officers of the Long Island Railroad are preparing a plan for the general equalization of wages of employees which will amount to approximately 5 per cent. of the total payrolls of the road, or $260,000 yearly. The classes of men principally affected are train and station men, clerks and expressmen, and the changes are to be dated January 1.

The Gulf, Texas & Western is installing a telephone for train despatching on its line between Jacksboro, Tex., and Benjamin. This is a road 105 miles long, located to the northwest of Fort Worth, Tex., connecting with the C., R. I. & G. and the Wichita Valley at Jacksboro and Seymour. The telephone apparatus was purchased from the Western Electric Co., New York.

Heavy snows in the Middle West again badly interfered last week with railway operation in and around Chicago and in a larger territory west and north of that city. Weather conditions thus far this winter have been more unfavorable to railway operation than in any winter for many years. The manager of one system said that for the first time in the history of his road water tanks had been frozen up and pipes bursted all along the line.

At a meeting of the Illinois Manufacturers' Association in Chicago on January 14 representatives of a large number of manufacturing and mercantile associations passed resolutions denouncing the federal corporation tax law and demanding its repeal. Delegates pledged themselves to "bring all possible influence to bear on the various members of congress to secure such repeal." A committee of 11 was appointed to carry on the campaign against the law and, if deemed advisable, to test its constitutionality in the courts.

The St. Louis Railway Club has adopted a resolution setting forth that at the solicitation of the Municipal Bridge & Terminal Commission of St. Louis the Terminal Railroad Association of that city acquired several million dollars' worth of real estate to supply additional trackage and is seeking to develop the property on terms that are not only fair but liberal to the city. The resolutions, therefore, ask that the city counsel enact the proposed ordinance authorizing the Terminal Railroad Association to go on with its improvement work.

In the past ten years the Pennsylvania Railroad has abolished 673 highway grade crossings on its lines east of Pittsburgh and Erie. Of these crossings 256 were on the main lines from New York to Washington and Pittsburgh, 78 being between Jersey City and Philadelphia. Between Philadelphia and Altoona, 235 miles, where the company has spent many millions in relocating lines, the number of crossings has been reduced in these ten years from 218 to 73. The largest job of this kind now pending is that at Bristol, Pa., where the line is to be changed and ten crossings cut out.

It is said that financial backing has been secured for a large power-development project at Keokuk, Ia. The government has granted a franchise for a dam across the Mississippi at this point and this franchise will expire on the 9th of next month unless actual work is in progress before that time. Hugh L. Cooper has pushed the organization of the company and if the project is carried out as he has planned it, the plant will be among the largest hydro-electric plants in the country. It is said that United Railways of St. Louis and several other light and power companies have already contracted for large amounts of power.

President Shonts, of the Interborough Metropolitan, has given out a statement in which he says that the Interborough is ready to build all the additional subways that there is now a demand and need for in New York, and that through arrangements with J. P. Morgan & Co. it will be possible for the Interborough to borrow $100,000,000 for construction work and for improvements. In a newspaper interview Mr. Shonts says: "We offer to double the present subway facilities and give the people the benefit of it for the same fare. We are now selling more transportation of its kind for a nickle than a nickle will buy anywhere else in the world."

The Pennsylvania Railroad's telegraph school, at Bedford, Pa., opened in September, 1907, is still flourishing. The company is introducing telephones extensively for block signaling, for train despatching and for messages; but, from this announcement about the school it would seem that the officers expect to make extensive use of both the telephone and the telegraph. The Bedford school has had, altogether, 234 students, of which number 126 have been graduated and are now employed as telegraphers. All graduates are offered positions on the road. An automatic sending machine has lately been put in, with which it is said the work of the students in receiving has been improved. The school now has a library of text books on electricity.

The Chicago Federation of Labor has adopted resolutions opposing the increase in second class mail rates proposed by President Taft. The resolutions state that this advance would practically kill all labor journals and periodicals depending upon individual subscription. The resolutions also allege that the government pays the railways 9 cents a pound for hauling second class matter, while the express companies pay the railways but five mills a pound for the same class of matter, and condemn the "questionable business ability and methods of the men at the head of our government who pay the railways 18 times as much as express companies pay for the same service." The resolutions call for a reduction in the price to be paid by the government to the railways for carrying second class mail.

On Monday, January 17, a special train of four cars, run for John Farson, Jr., traversed the distance between New York and Chicago over the New York Central and the Lake Shore & Michigan Southern between 5 o'clock in the morning and about 10 in the evening (or 11 o'clock Eastern time). The train made very fast time as far as Elkhart but west of there was compelled to run slowly at many places on account of fog, so that the actual time through was about 18 hours, 30 minutes, as against an expected record of less than 16 hours. According to newspaper reports, the train cost Mr. Farson $3,075. The number of passengers charged for was 100, although there was only one on the train, and for these an arbitrary charge of two cents a mile, measured by the shortest line, was made. The shortest line between New York and Chicago being the Pennsylvania, the bill was $1,824 (for 912 miles). In addition to this, $150 was charged for a special Pullman car and there was a charge of $1 an hour against each of the imaginary hundred passengers for the fast time, that is to say, for all of the time saved as compared with the standard schedule of 28 hours. The reporter's figures do not correspond in all details; but they show, no doubt, that the train cost Mr. Farson something over $3 a mile.

Worst Railway Washout Ever Known.

No decision has been reached as to the route to be followed in replacing the line of the San Pedro, Los Angeles & Salt Lake along the Meadow Valley Wash in southeastern Nevada, of which almost 100 miles south of Caliente was completely

gutted by floods on December 31. The route was originally chosen, despite its precarious features, because of the great saving in distance. Not long after its construction it was undermined by a storm, which wrought $600,000 or $700,000 of damage. An officer of the road says that the washout was due to remarkable conditions prevailing all over the country, which was covered with snow from southern California to New York. In Nevada the accumulated snowfall by December 28 amounted to eighteen inches. Warm winds coming over the mountains melted the entire precipitation in a few hours and the ensuing rains added so much to the volume of the mountain streams that the Meadow Valley river tore its way through embankments, bridge abutments and everything. Engineers are in the field to locate the best course for the line from the standpoint not only of cost of construction, but also of minimum distance and traffic value of any new section which may be served. Whether the survey shall skirt the Mormon Range on the southeastern side, running into southwestern Utah through St. George, or shall keep to the west of the Meadow Valley Range, running east into Utah through Pioche, is still undecided. The former would cost probably a third more to construct, but would carry the road through fertile virgin territory in southern Utah, whereas Nevada has little to offer aside from the mining sections, which are already served with transportation.

Whatever route may be decided upon, it will be from six months to a year before the road will be in shape to take through traffic. Whatever outlay will be required will depend largely on the chosen route, but the rehabilitation will involve an expenditure of between $10,000,000 and $15,000,000.—*Wall Street Journal.*

Wood Preservers' Association.

The Wood Preservers' Association held its sixth annual meeting at the Auditorium Hotel, Chicago, January 18, 19 and 20. About 60 members were in attendance and the visitors present increased the attendance to 75. The meeting opened Tuesday morning with a business session. Tuesday afternoon, Wednesday forenoon and afternoon and Thursday forenoon were devoted to the reading and discussion of papers. Officers were elected Thursday afternoon, but the result of the election was not known in time to include the list of next year's officers in this report.

Statistics received by the Secretary as to the amount of lumber treated during 1909 were as follows:

Piling and poles	9,591,200	lin. ft.
Lumber	74,381,700	"
Bridge timbers	17,070,770	"
Cross ties	21,521,180	"
Miscellaneous	1,971,140	"

These figures include treatment by all methods, but are not complete owing to the neglect of some companies to send in reports. The totals probably should be increased 10 per cent. to secure the actual output of treated timber in the United States for the past year.

Eighteen subjects for papers were assigned, but some members preferred to substitute a short talk for a written paper.

J. B. Card, superintendent of the Chicago Tie and Timber Preserving Co., read a paper on "What Per Cent. of Creosote Oil Can Be Withdrawn from Wood by Subsequent Vacuum?" He showed by the results of tests made at the plants of the Chicago Tie and Timber Preserving Co. and the Chicago Burlington & Quincy that an average of 10.4 per cent. of the oil can be recovered by using a final vacuum of 26 in. for 2 hours, while an average of 10 per cent. is recovered by merely allowing the ties to drip for two hours. Tests of the use of an initial vacuum showed that its use reduced the average amount of oil recovered by a final vacuum to 4.03 per cent. and by dripping to 3.88 per cent. These tests tend to show the futility of seeking to recover the oil by applying a final vacuum, and Mr. Card expressed the hope that the problem might soon be solved, as it is one of vital importance to all concerned.

J. C. Williams, superintendent of the wood preserving department of the Barber Asphalt Co., spoke on the "Effect of the Time of Cutting Timber on the Rate of Seasoning." He said, in brief, that the time of cutting affects the seasoning and treatment because the moisture content in timber and the weather conditions vary with the season. He recommended spring and summer cutting.

Two papers were presented on the "Advantages and Economy of Various Retort Doors." Samuel M. Rowe spoke in favor of the spider door with ball bearings. David Allerton recommended the single piece cast steel door with cranes as a substitute for the present roller bearing to guide the door into place. He also suggested the use of a vertical swinging door, hinged at the top, to be raised by a suitable hoist.

Prevention of Fires was discussed by H. J. Whitmore, superintendent of the Missouri, Kansas and Texas Railway Wood Preserving Works. He summarized the needed precautions as follows: (1) Never allow leaks in oil pipes; (2) build plant fireproof; (3) never allow open lights around plant; (4) have fire pumps removed from plant and use a high tank of sufficient capacity; (5) allow ample room between buildings; (6) provide steam pipes in pump room to be used to smother fire.

"Results Obtained by Treating with Crude Petroleum," was presented by C. Marshall Taylor, in charge department of chemistry and tests, International Creosoting and Construction Co. Very few results are available as yet and the most of his paper dealt with the method of treatment in use on the National Railways of Mexico and the Atchison, Topeka & Santa Fe. He stated that ties in the Bound Brook division of the Central of New Jersey, treated with "still bottoms," a heavy petroleum residue, had had a life of 30 years. Ties treated by the Santa Fe method have been in service three years and are entirely free from signs of decay.

H. M. Rollins, superintendent of the Texas & New Orleans Wood Preserving Works, spoke on the "Inflammability of Treated Timber." Since the zinc chloride used in burnetizing is widely used in fireproofing compounds, it was conceded that wood so treated is less inflammable than untreated wood, and Mr. Rollins confined his paper to wood treated by creosoting. He showed by reasoning and by the results of tests that wood so treated is at first rendered more inflammable but that it gradually loses this property, finally becoming much less inflammable than the untreated wood. He explained this action as due to the vaporization of the lighter oils and the consequent deposit of the residues on the surface of the wood. Tests on treated and untreated poles showed that the former were only slightly charred, the fire going out of its own accord after about ten minutes, while the latter under similar treatment were completely burned through, the fire continuing for two and one-half hours.

F. J. Angier read a paper on the "Proper Grouping of Timbers for Treating," in which he recommended the division of all woods into three classes based on the per cent. of absorption. The first class would include woods absorbing less than 23 per cent., the second those absorbing between 23 per cent. and 30 per cent., and the third those absorbing more than 30 per cent. These absorptions are to be figured by volume. In dimension timber, Mr. Angier suggests four classes: (1) Sticks 3 in. and under; (2) 4 in. to 6 in. sticks; (3) 8 in. to 10 in. sticks, and (4) all sticks 10 in. and over.

Andrew Gibson, superintendent of timber preservation on the Northern Pacific, in his paper on "Economics of Cables, Electricity and Locomotives in Moving Materials at Plant," recommended, from his own experience, the electric locomotive. The conditions at the plant described are a long haul and a level grade, and Mr. Gibson admits that under opposite conditions the cable might be more economical, but under no conditions would he allow the use of steam or fuel oil locomotives on account of the fire risk.

The "Amounts of Various Antiseptics Required per Cubic Foot to Obtain Good Results for Various Purposes" was briefly discussed by R. L. Allardyce, general superintendent, International Creosoting and Construction Co. He advocated the following amounts in the creosoting process:

Marine work	22 lbs. per cu. ft. up
Round and sheet piling	15 to 20 lbs. per cu. ft.
Caps, stringers, braces	12 " 15 " " "
Decking	15 " 20 " " "
Telegraph and telephone poles	12 " 15 " " "
Ties	10 " " "

In the zinc and oil process he recommended the use of about ½ lb. of zinc chloride and 3 to 4 lbs. of oil per cu. ft. In the burnetizing process he suggested for dry climates the use of ½ lb. of zinc chloride in 15 lbs. of water per cu. ft.

Quadrennial Weighing of Mails in the West.

The regular quadrennial weighing of the United States mails, for the purpose of determining the rates of compensation payable to the railways in the fourth contract section for its transportation for four years from July 1, 1910, will begin early in February, and under the present laws continue for 105 days. The section covered consists of Louisiana, Arkansas, Oklahoma, Kansas, Nebraska, South Dakota, North Dakota and all territory in the United States west to the Pacific coast, including also Alaska, Hawaii and the Philippine Islands. This will be the first instance in the history of this territory of the application of the postmaster-general's orders 165 and 412, which require the use of the seven-day divisor in obtaining the average daily weight of mails handled on which the pay to railways is based, instead of the six-day divisor in use heretofore. The orders referred to read as follows:

Order 165:

"Ordered, That when the weight of mail is taken on railway routes the whole number of days the mails are weighed shall be used as a divisor for obtaining the average weight per day."

Order 412:

"Ordered, That Order No. 165, dated March 2, 1907, be, and the same is, hereby amended to read as follows:

"'That when the weight of mail is taken on railway routes the whole number of days included in the weighing period shall be used as a divisor for obtaining the average weight per day.'"

While the wonderful increase in population and in the development of natural resources in this great territory since the last mail weighing four years ago has resulted in even a greater proportionate increase in volume of mail handled, it is quite doubtful if an increase in compensation to railways will result. This is owing to the use of the seven-day divisor above explained. In support of this a portion of the report of the second assistant postmaster-general to the postmaster-general for the fiscal year ended June 30, 1907, with reference to the weighing and readjustment in the contract section just east of the territory to be weighed this year, and where the postmaster-general's orders 165 and 412 were first applied, is quoted:

"During the fiscal year (ending June 30, 1907) the mails were weighed on the railway routes in the third section, embracing the states of Ohio, Indiana, Illinois, Michigan, Wisconson, Minnesota, Iowa and Missouri. The annual rate of expenditure for railway transportation in that section on June 30, 1907, was $15,772,677.97.

"The result of the readjustment of the pay for railway transportation effective July 1, 1907, in this section for the ensuing four years based upon the reweighing shows a decrease of $45,704.51, being 0.29 per cent. The reduction in transportation rate is due to the application of the provisions of the act of March 2, 1907, reducing the rates of compensation, to the use of the whole number of days in the weighing period as the divisor in ascertaining the average daily weight, and in the withdrawal of equipment and supplies from the mails."

It is of interest to note that the increase in railway compensation in the third contract section mentioned above for the quadrennial period ending June 30, 1907, over the one ending June 30, 1903, was $2,439,112.83, or 18.05 per cent., while as above shown in the following four-year period there was an actual decrease of 0.29 per cent., due almost entirely to the application of the orders of the postmaster-general referred to.

In the fourth contract section the increase in railway mail compensation in the quadrennial period commencing July 1, 1906, based on the weighing of 1906, over the four-year period just preceding, was $3,406,292.28, or 31.10 per cent., which shows the rapid increase in business and in mail handled in that section, and as the development of this section has progressed rather more rapidly in the last four years than in the similar period just preceding, it follows that the amount of mail handled and the rate of pay should show an equal, if not a greater, increase this year over four years ago, but through the application of the postmaster-general's orders referred to none or but little increase in their pay is hoped for by the railways in this section. The report of the second assistant postmaster-general to the postmaster-general for the fiscal year ended June 30, 1906, says:

"During the past fiscal year (ending June 30, 1906) the mails were weighed on the railway routes in the fourth section, embracing the states of Arkansas, Louisiana, Texas, Kansas, Nebraska, South Dakota, North Dakota, Montana, Wyoming, Colorado, Utah, Idaho, Washington, Oregon, Nevada and California, Indian Territory and the territories of Oklahoma, New Mexico, Arizona, Alaska and Hawaii. The annual rate of expenditure for railway transportation effective July 1, 1906, in this section for the ensuing four years, based on the reweighing, was an increase of $3,406,292.28, or 31.10 per cent.

"A year ago in preparing the estimates for the current year this item was placed at 15 per cent., that being approximately the increase shown by the previous quadrennial weighing. In seeking some explanation of the unusual and unexpected increase, based on the weights taken during the weighing period in the fourth contract section, an examination has been made of the increase in gross revenues during the same four-year period at a few of the most important cities in different parts of the section weighed, and Chicago has been included as being the city at almost the eastern edge of the fourth contract section through which so large a part of the mail would pass in going to and from that section. A comparison has been made between the gross revenues of these postoffices for the fiscal years ended June 30, 1902, and June 30, 1906, respectively. The increase shown (omitting fractions) is as follows: Los Angeles, Cal., 134 per cent.; Oklahoma, Okla., 124 per cent.; Fort Worth, Tex., 103 per cent.; Portland, Ore., 101 per cent.; Seattle, Wash., 99 per cent.; Chicago, Ill., 50 per cent.; Denver, Colo., 40 per cent., and San Francisco, Cal., 33 per cent. In view of this total increase in gross revenues, which indicates corresponding increases in the volume of mail handled, it is less surprising that the increase resulting from the readjustment of compensation on the weights last taken for this section should amount to approximately 31 per cent."

It is of interest to note that while the law requiring weights to be taken for 105 consecutive working days was in effect in 1906, the weighing of that year was abruptly brought to an end April 17, 1906, the day preceding the earthquake in San Francisco, which resulted in utter demoralization of the railways in that section of the country as well as seriously affecting business conditions all over the west and resulting in a perceptible falling off in volume of mail handled. By the action of Congress the postmaster-general was authorized to terminate the official weighing at midnight of April 17, 1906, on account of this, and to base the readjustment on the first 57 days of the weighing.

Passenger Station Economy.

Having discussed the passenger station both in its utilitarian and architectural aspects, we must now consider it from the viewpoint of railway housekeeping. Let us assume that a certain city is provided with station facilities that are not quite up to the standard of similar facilities in some other places of approximately the same population and commercial importance. They are not such as the community would like to have, and they are not such as the railway management would consider ideal. The community believes it is entitled to the best of everything. It does not want a station that will be merely as good as one in a nearby town of the same size. It wants a better one. It would like to have the best and most beautiful station of any town of the same relative importance in that whole section of the country, and it does not hesitate to say so through its municipal officers, its commercial organizations and its newspapers.

The railway manager is in much the same position as the housekeeper when the old piano, which is still fairly good as a musical instrument, has had its case battered and scratched and the daughter of the family demands a new one. If he could draw on unlimited supplies of money he would like to provide every city on his line with an architectural monument, and every little way station with an artistic gem. It would be a splendid advertisement of his road, and the American Institute of Architects would hail him as the greatest railway manager the world had ever seen. But, just as the housekeeper who would like to buy a new piano must think first of the monthly grocery bill, of the needs of the family for clothes, of the leak in the roof, and, possibly, of the necessity of an addition to the house, so the railway

manager, whose resources are always strictly limited by the earnings of the road and its credit, must think of his operating expenses, fixed charges, and taxes, and of the need of additional tracks, more cars, and additional and more powerful locomotives. He is glad to contribute to the gratification of the artistic taste of the public, but his first duty is to haul the public and its property over his lines. It may well be that the money which the new station would cost, if expended for additional tracks, would be far more beneficial to their city as a whole than would be the most splendid passenger station to which they could aspire. In that case their interests and those of the railway are identical, and it is better for all concerned that they should put up with the not entirely satisfactory station facilities for a few years longer rather than the more vital improvements should be delayed. Capital invested in passenger stations in excess of the amount necessary to provide adequate and proper facilities for doing passenger business is unproductive. It is probably not unreasonable that a station in the National Capital should bear some relation to the public buildings of the Government, that the building and its appurtenant trackage should be sufficient to handle the inauguration throngs, and that special accommodations should be provided for a single occasional traveler—the President of the United States. The fact remains, however, that the passenger terminal facilities of Washington are such that they are only fully used for a few days every four years, and that the cost of their operation and maintenance, including the fixed charges on the capital investment, are a heavy burden on the railways using it, and all without bringing them an additional dollar of revenue by reason of its use. The members of your association can contribute more than any other set of men to solving the passenger station problem by the evolution of a type of passenger station which will afford the best possible facilities and which will be artistic, without involving expenditures for elaborate ornamentation and decoration.—*W. W. Finley, before American Institute of Architects, December* 16.

The Shoshone Dam.

Press despatches announce the completion of the Shoshone dam in Wyoming, the highest in the world. It has been built by the reclamation service and is 328.4 ft. high. It is situated in the cañon of the Shoshone river, in northern Wyoming. The walls of the gorge are nearly perpendicular, and rise nearly 2,000 ft. above the stream. At its base the width of the gorge (and the length of the dam) is 70 ft. On top the length of the dam is 175 ft., and at the bottom it is 108 ft. wide.

The contract was let for this structure on September 18, 1905, to Prendergast & Clarkson, of Chicago, for $515,730. The contractors defaulted in August, 1906, and the work was then taken up by the sureties. The dam creates an enormous reservoir with a surface area of 10 square miles and an average depth of 70 ft. Its capacity in gallons is 148,588,512,000.

The B. & O. Bridge at Havre de Grace.

The Baltimore & Ohio on January 6 began using its new double-track steel bridge across the Susquehanna river at Havre de Grace, Md. This new bridge was buillt at a cost of over $2,000,000. It is slightly more than a mile in length. The river at this point is divided by Watson's island, upon which about one-third of the bridge rests. The superstructure is double-track throughout and consists of east approach, 80-ft. deck plate girder; 120-ft. deck truss span and 72-ft. deck girder span. Bridge over the east channel: One 380-ft. through truss span, one 520-ft. deck span and one 240-ft. deck span. Viaduct on Watson's island: One 115-ft. deck girder span, twenty-one 90-ft. deck girder spans and one 77-ft. deck girder span. The bridge over the west channel consists of one 520-ft. through truss span and eight 240-ft. deck truss spans. The west approach consists of one 103-ft. deck girder span and one 71-ft. deck girder span. The total weight of the steel is 16,000 tons.

The piers and abutments contain about 25,000 cu. yds. of concrete masonry and 8,800 cu. yds. of stone masonry. In this reconstruction 30 new piers were built and 10 remodeled, widened and raised. Three of the new masonry piers in the west channel were sunk in the bed of the river by the caisson process to solid rock foundation at a depth of 58, 68 and 75 ft. below tide. The work was begun in November, 1907.

The officers in charge of the work were: A. M. Kinsman, chief engineer of the road; W. S. Bouton, engineer of bridges; John T. Wilson, assistant engineer, and E. B. Graham, resident engineer. J. E. Greiner and C. C. Schneider were the consulting engineers.

Railway Matters in Washington.

Washington, January 19.

The House Committee on Interstate and Foreign Commerce has voted to have hearings every Wednesday, but no schedule of subjects has yet been issued. There has been much desultory talk among congressmen concerning the President's railway proposals, but there does not as yet seem to be any crystallization of sentiment, and some observers characterize the situation as one of marked indifference among congressmen generally. On the question of control of capitalization, however, the indications are that a decided difference of opinion will develop and that nothing can be done with that part of the President's message at this session. Probably the power to suspend a rate will be opposed, as will the proposition to establish an interstate commerce court; but there is really little of a definite nature which can be said concerning any of the proposals at present.

The visit of President Lovett of the Union Pacific and other representatives of that company to Washington last week to induce President Taft to withdraw the suit of the government against the Pacific roads appears to have been fruitless. According to reports the railway men made strenuous representations to the President that the suit of the government, which was brought in Utah two years ago, to compel the separation of the Southern Pacific from the Union Pacific was sure to fail because these railways are not competitors in such a sense that their joint operation violates the anti-trust law. The attorney-general, who joined President Taft in conferring with the railway officers, has been considering the subject in detail, but it is said that thus far he has found nothing to justify the government in withdrawing the suit.

Proposed Modification of Pennsylvania Pensions.

The action of several thousand employees of the Pennsylvania Railroad in asking the company to pay larger pensions, the addition to be provided for by contributions from the employees, has already been noticed in these columns. From a correspondent in Harrisburg we have the following particulars, from which it appears that both the officers of the company and large numbers of the employees are favorable to the project, but that some important details are yet to be adjusted. Our correspondent says:

"Present indications rather confirm the impression that the movement started during the fall of 1909 among the Brotherhood employees of the Pennsylvania Railroad to provide larger pensions for the men than are now paid by the company will be successful in the near future. The proposition of the joint brotherhood committee which called upon General Manager Myers in Philadelphia was that each of the 80,000 or more employees of the company contribute from his earnings the sum of two cents a day, or 60 cents a month, and receive from the company after voluntary or compulsory retirement a pension of $25 a month over and above the amount he would receive under the present system, which for one who has served 33 years is one-third of his average pay for about ten years prior to his retirement. For example, a passenger engineer earning $150 a month, who retired last month receives about $55 a month, and under the new plan of paying two cents a day he would receive $80. Papers setting forth the willingness of the company to put the new plan into effect as soon as a majority of the employees have indicated their preference for it have been distributed throughout the system, and one paper in Harrisburg has over 2,000 signatures of assenting employees already. The company would probably require the men to contribute for one year before the $25 additional monthly payment to pensions would be applicable.

It is proposed also to change the retirement age as follows: Voluntary retirement from 65 to 60 years; compulsory retirement from 70 to 65 years. There seems to be some opposition to the new plan on the part of the younger element of the employees, many of whom figure that they would not benefit from the two cents a day payment because of the longer period of payment. To these the reply is made that the retirement five years earlier than at present of the older men would mean more rapid promotion for the younger. Under the new plan it is proposed to allow present pensioners to join in paying the two cents along with employees now on the rolls and to receive the $25 a month. All classes of employees from the engine-wiper and track-hand to passenger engineers and firemen would be required to pay the two cents a day, provided they signed for the new plan."

Commissioner Clark on Railway Valuation.*

"Sometimes when I read or listen to a cleverly conceived and well presented theory I wish that I had been endowed with a nature that did not gravitate so quickly and so directly to the practical. The theory of basing transportation charges upon a valuation of the properties of the carriers and of rewarding reductions in charges with additional dividends was recently suggested. Now, if one company owned all of the transportation lines and the officers of that company, or some regulating body, could arrange a schedule of rates that would be satisfactory to every locality served, together with an equally satisfactory formula for ascertaining the increases and decreases in rates that would be necessary in order to maintain a proper relation between gross earnings and net available for dividends, it would seem an attractive plan; although some jealousies might develop about taxation and as to the localities that should first be accorded new terminals, double-tracking, etc. Clearly reductions in rates would not provide for increased revenue available for extra dividends unless the increase in revenue resulted in increased volume of traffic.

"However, one company cannot own all the lines unless that company be our Uncle Sam. I am sure none of us advocate such ownership, and therefore we must look at this matter from the practical standpoint of actual conditions. There are several lines of railway between Chicago and New York. Some of them have their own lines all the way and some must join with others in order to make a through line. No two of them have just the same physical characteristics. No two of them have the same mileage of second and additional main tracks. No two of them have the same ratio of equipment. No two of them have the same interest bearing debt, capitalization or fixed charges. No two of them have the same valuation, whether that valuation be based upon original cost, reproduction cost or present value as a going concern. And yet their charges must be so nearly the same that any difference therein is fully compensated for in service, or the traffic will follow the line of least resistance, which, in this connection, is the line of lowest charge. What would be a reasonable return on the value or capitalization of one of them might spell ruin for another and riot or riches for still another."

Crude Oil for Tie Treatment.

The Santa Fe began the use of California crude oil for treating pine ties in 1901, and the ties put in the track in February, 1902, are to-day in first class condition without a sign of decay, although untreated pine ties in the same track would not last over two years. Two and a half years ago a lot of pine ties were treated in this way and sent down to the Mexican Central, Tampico branch, which, for ties, has about the most destructive climate to be found in North America. The untreated pine ties which were used there had an average life of something over a year, but the ties treated with California oil when recently inspected were in excellent shape. At Albuquerque, N. Mex., the Santa Fe is using crude oil for all the pine ties used in that territory. It is not used for spruce or the harder woods because this oil will not penetrate these woods in a satisfactory manner. Creosote is therefore used for this class of ties. At the Somerville tie-treating plant of the Santa Fe, some crude oil is used, but only in experimental work, in the way of mixing certain proportions of creosote and crude oil. The results of such mixtures have not yet developed.

*From an address by Hon. E. E. Clark, of the Interstate Commerce Commission, December 29.

The Pennsylvania Promoting Good Roads.

Following up its campaign in the interest of good roads in the states through which it operates, the Pennsylvania Railroad has arranged with D. Ward King, the good roads expert, to deliver lectures on methods for making good roads, beginning at Lancaster, Pa., Dec. 27. On November 18 there was a meeting of P. R. R. agents from the Williamsport and Susquehanna division at Williamsport, which was addressed by experts in the use of the King split log drag, a device which farmers themselves make after patterns furnished free by Mr. King. The meeting at Williamsport was followed by a meeting of the general manager's staff in Philadelphia December 17 to discuss methods for improving the roads radiating from the company's stations. The object of all of this campaign is to make the roads to the railway passable so that farmers can receive and deliver freight in all kinds of weather.

There are approximately 99,000 miles of country roads in the state of Pennsylvania, and only 2,000 miles are macadamized. In view of the fact that it will cost approximately $10,000 a mile to macadamize these roads, the solution of the problem lies in the employment of less expensive means. It is to introduce such methods to the farmers that the railway company has undertaken this campaign. Mr. King will lecture at Millersburg, Sunbury, Milton and other places.

American Railway Organization in England.

The Midland Railway of England has recently been reorganizing its staff in what were formerly called the departments of the locomotive superintendent and superintendent-of-the-line. Cecil Paget still continues to hold the office of general superintendent, to which he was appointed in 1907. R. M. Deeley, the locomotive superintendent, resigned in July last, and the works manager, H. Fowler, has been appointed to succeed him, with the title of chief mechanical engineer. Other new offices created in this reorganization, which are unusual on English roads, are: A. J. Owen, superintendent of operation; L. C. Geach, superintendent of motive power; J. Bagwell, superintendent of passenger service, and E. R. Ward, general passenger agent. The titles of indoor and outdoor assistants to superintendents-of-the-line are abolished.

Missouri, Kansas & Texas.

The operating ratio, after payment of taxes, of the Missouri, Kansas & Texas in November, 1909, was 74.2 per cent., and in November, 1908, was 76.3 per cent. This is a decrease in 1909 from the 1908 figures of 2.1 per cent. In the comment in last week's issue of the *Railway Age Gazette* on the railway earnings in November the operating ratio of the Missouri, Kansas & Texas was incorrectly stated.

Western Society of Engineers.

The society installed its newly elected officers at the annual dinner held in the University Club, Chicago, on January 12. The officers for 1910 are: President, J. W. Alvord; first vice-president, O. P. Chamberlain; second vice-president, A. Bement; third vice-president, W. K. Hatt; treasurer, A. Reichmann; trustees, L. E. Ritter, G. M. Brill and W. W. Curtiss.

New York Railroad Club.

George A. Post, president of the Railway Business Association, will address the club at its meeting on Friday, January 21, concerning the work of that organization which has had and is having the thoughtful attention and active interest of both the railway and business world. It is probable that others will have something to say on the same subject and the club

has asked the association, through its officers, to be its guests, so that the occasion promises to be of unusual interest and importance.

Omaha Railway Club.

The annual meeting of the Omaha Railway Club was held on January 10. An amendment to the constitution was adopted, reducing the number of directors from 15 to 7. The following directors were elected: D. B. Allan, Howard Bruner, L. M. Dooley, R. E. Hayward, W. H. Jones, H. C. Piculell and T. Montmorency. The present membership is about 300, and efforts are being made to increase it to 400 or 500.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.; May 10-13; Indianapolis.
AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—March 28, Havana, Cuba.
AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa. June, 1910; Niagara Falls, Ont.
AMERICAN ASSOC. OF LOCAL FREIGHT AGENTS' ASSN'S.—G. W. Dennison, Penna. Co., Toledo, Ohio.
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.—R. W. Pope 33 West 39th St., New York; second Friday in month; New York.
AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York; May 18; New York.
AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—S. F. Patterson, B. & M., Concord, N. H.
AMERICAN RAILWAY ENGINEERING AND MAINT. OF WAY ASSOC.—E. H. Fritch, Monadnock Bldg., Chicago, March 14-17, 1910; Chicago.
AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis; second Tuesday, May; Memphis, Tenn.
AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony Building, Chicago; June 20-22; Atlantic City.
AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. Edgar Marburg, Univ. of Pa., Philadelphia.
AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., N. Y.; 1st and 3d Wed., except July and August; New York.
AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., N. Y.; 2d Tues. in month; New York.
AMERICAN STREET AND INTERURBAN RAILWAY ASSOCIATION.—B. V. Swenson, 29 W. 39th St., New York.
ASSOCIATION OF AM. RY. ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; June 29, 1910; Colorado Springs.
ASSOCIATION OF RAILWAY CLAIM AGENTS.—E. H. Hemus, A., T. & S. F., Topeka, Kan.; May; Nashville, Tenn.
ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, Wisconsin Central Ry., Chicago; May 16-20, 1910; Los Angeles.
ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 24 Park Place, N. Y.
BUFFALO TRANSPORTATION CLUB.—J. N. Sells, Buffalo.
CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug.; Montreal.
CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, Montreal, Que.; irregular, usually weekly; Montreal.
CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.
FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Rich., Fred. & Pot. R. R., Richmond, Va.; June 15, 1910; California.
INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.
INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago; May; Chicago.
INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn.; May; Cincinnati.
IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.
MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony Bldg., Chicago; June 15-17; Atlantic City.
NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tues. in month, ex. June, July, Aug. and Sept.; Boston.
NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York.; 3d Friday in month, except June, July and August; New York.
NORTH-WEST RAILWAY CLUB.—T. W. Flanagan, Soo Line, Minn.; 1st Tues. after 2d Mon., ex. June, July, August; St. Paul and Minn.
NORTHERN RAILWAY CLUB.—Fourth Saturday in month. Duluth, Minn.
RAILROAD CLUB OF KANSAS CITY.—Third Friday in month. Kansas City.
RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, Pittsburgh, Pa.; 4th Friday in month, except June, July and August; Pittsburgh.
RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.
RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio; May 16-18; St. Louis.
RICHMOND RAILROAD CLUB.—Second Monday in month. Richmond, Va.
ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.
ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.
SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Norquist, Chicago.
SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. H. O'Donnell, Bogalusa, La.
SOUTHERN AND SOUTHWESTERN RY. CLUB.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs., Jan., April, Aug. and Nov.; Atlanta.
TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R. R. R., East Buffalo, N. Y.
WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, 199 Chestnut St., Winnipeg; 2d Monday, except June, July and August; Winnipeg.
WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony Bldg., Chicago; 3d Tuesday each month, except June, July and August; Chicago.
WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, Monadnock Bldg., Chicago; 3d, Wednesday, except July and August; Chicago.

Traffic News.

The Western Classification Committee met in San Antonio, Tex., last week. A dinner was given to the visitors on the evening of January 14.

The Denver, Laramie & Northwestern opened for traffic its first completed division, that between Denver, Colo., and Milliken, 43 miles, on January 17.

The Great Northern has withdrawn all of the annual passes heretofore held by employment agents doing business in northern Minnesota. Extensive frauds have been discovered in the use of passes by employment agents.

The New York State Public Service Commission, Second District, has issued its report of passenger trains for the month of November, from which it appears that of the 54,981 trains run in that month, 84 per cent. were on time at division terminals.

The Kansas City, Mexico & Orient has filed application with the Oklahoma Corporation Commission for an order relieving it from the 2-cent fare provision of the state constitution. The company lost $100,000 on its passenger business in Oklahoma in the year ending with last June.

A member of the Missouri Railway Commission states that the commission's rate clerk is engaged in working up schedules of rates on different commodities and that when he has finished his work the commission will probably undertake a complete revision of freight rates schedules.

A press despatch from Nashville says that the Tennessee Central has made up its differences with the Illinois Central and the Southern Railway and that through traffic agreements existing between these companies will be continued as at present, notwithstanding the recent notice of probable termination.

The Northwestern Cedarmen's Association, at its meeting in Chicago on January 12, instructed its railway committee to draw up resolutions condemning the decision of the Interstate Commerce Commission in the so-called tap line case, and endorsing the dissenting opinion filed by Commissioner Prouty.

The Illinois Railway Commission resumed on January 11 its hearings regarding the reasonableness of express rates in Illinois. The complaints are directed especially against advances that have been made from Chicago to surrounding suburbs. In February, 1907, the rate was advanced from 30 cents per 100 lbs. to 40 cents, and in September, 1908, to 50 cents. J. C. Zimmerman, general manager of the Adams Express Company, and J. H. Bradley, vice-president and traffic manager of the American Express Company, testified that the increases in rates were made because of increases in operating expenses.

Following up the company's campaign in the interests of scientific farming, the division freight agents of the Pennsylvania are distributing to the farmers throughout the State of Pennsylvania the first booklet dealing with methods for cultivation of alfalfa. Another is entitled "Use of Lime on Land." The use of lime is essential to the cultivation of alfalfa. The booklets contain lists of shippers of agricultural lime, lime stone and fertilizers. The company is educating the station agents along the lines to become agricultural missionaries. In addition, the company has become identified with the good roads movement in the state of Pennsylvania.

Following the flood which washed away 90 miles of the San Pedro, Los Angeles & Salt Lake, the other railways telegraphed to the Interstate Commerce Commission for authority to make an emergency rate of 30 cents per 100 pounds [by another route from Salt Lake to Los Angeles and vice versa] on all goods in transit on this road, the object being to save the perishable freight and help straighten out the tangle of traffic. The commission denied the request. A newspaper despatch from Salt Lake says: "This refusal will result in heavy loss to both the wrecked railway and to shippers, as it is doubtful if the road can be held responsible for all losses under such unavoidable and unforeseen conditions. Freight half way to Los Angeles must be brought back to Salt Lake and shipped west via Sacramento over the Southern Pacific at

full rates, when the Southern Pacific is willing to grant the emergency rate of 30 cents on all traffic from the wrecked road to aid the road and the public."

The Western Fruit Shippers' Association, at its recent meeting in Denver, adopted resolutions declaring that the Interstate Commerce Commission should adopt a uniform classification of freight, to be changeable only by the commission; that published freight tariffs should show in one rate all charges for transportation, including refrigeration; that the commission should have power to fix minimum as well as maximum rates; that federal district attorneys should be required to formulate complaints for aggrieved shippers and to prosecute them before the Interstate Commission at government expense; and that the railways should be required to settle all legitimate claims within 90 days or pay interest.

The Terminal Railroad Association of St. Louis has announced that after March 1 it will make no switching allowances to the Manufacturers' Railway, which serves the Anheuser-Busch Brewing Company; the Des Peres Valley, serving the Scullin-Gallagher Works; the Granite City & Mississippi Valley, serving the Corn Products Company in East St. Louis; the Granite City, Alton & Eastern, serving the Commonwealth Steel Company; the industrial road of the Republic Iron & Steel Company; the St. Louis, Baden & Terminal Railroad, serving the St. Louis Car Company, and the Western Cable, serving the Lemp Brewing Company. After the date mentioned all concerns served by these various industrial lines will be required to pay to the railways the full St. Louis rate on all shipments.

The different railways leading west from New York have been considering a proposition to reduce by 50 per cent. the differentials on westbound freight enjoyed by those lines which are not rated as first-class, such as those which take freight to Baltimore or Norfolk by water; the Central Vermont, taking freight by water to New London, and the New York, Ontario & Western. The reports say that all of the lines except the Grand Trunk have practically agreed to the change, which would raise the rate to Chicago from 65 cents per 100 lbs., first-class, to 70 cents, and the other classes in proportion. The rate by the standard lines, first-class, is 75 cents. In the month of August last the New York, Ontario & Western, it is said, took out of New York as much freight for western points as did the Pennsylvania. For the 11 months ending with last November, the Ontario carried west 147,000 tons of import freight, while the Pennsylvania secured only 324,000 tons, or but little more than twice the quantity taken by the Ontario.

Vice president C. S. Clarke, of the Missouri Pacific, says that that company, in connection with the agricultural department at Washington, has been investigating farming conditions and giving good advice to the farmers in the Southwest for the past five years—from which it would seem that those railways which have heralded their farming activities in the newspapers so constantly for the last year or two have been securing more than their fair share of the glory. The Missouri Pacific has not said much about its operations. Three years ago 15 farmers made some experiments under the direction of the Missouri Pacific experts, and now there are 5,000 who are following the same course. Thirty one demonstrators are kept on the road instructing and advising these 5,000 farmers. In many regions where dry farming is possible, one half the arid land has been reclaimed. Land which five years ago sold for $1 an acre is now held at $100 an acre. Severe drought has caused losses in the Southwest during the past six months, but recent rains and snows have restored the lands. These snows have extended 50 miles farther into the desert than ever before in the memory of the inhabitants.

On February 2 through package freight car service will be established from Chicago to Knight's Key, Fla., by two different roads, the Cleveland, Cincinnati, Chicago & St. Louis and the Illinois Central. This service will later be extended to Havana, Cuba. The Big Four's car will leave Chicago daily, going over the Big Four to Cincinnati; from there over the Queen & Crescent to Chattanooga; from Chattanooga to Atlanta over the Southern Railway; from Atlanta to Offerman, Ga., over the Atlanta, Birmingham & Atlantic; from Offerman to Jacksonville over the Atlantic Coast Line and from Jacksonville to Knight's Key over the Florida East Coast. The Illinois Central's car will be run weekly, leaving Chicago every Saturday. It will be run over the Illinois Central to Birmingham, Ala.; from there to Albany, Ga., over the Central of Georgia; from Albany to Jacksonville over the Atlantic Coast Line, and from Jacksonville to Knight's Key over the Florida East Coast. When the Florida East Coast shall have been completed to Key West the cars will be taken to Key West and ferried from there to Havana. Delivery will be made at Jacksonville on the fourth morning, at Knight's Key on the sixth morning and at Havana on the seventh.

Results of Package Car Service from St. Louis.

In a recent address before the Traffic Club of St. Louis, B. M. Flippin, freight traffic manager of the Missouri Pacific, said:

"There are operated daily approximately 1,000 package cars from St. Louis, diverging to all sections of the country. Particularly is this service exceptionally good in the direction of the West and Southwest, affording St. Louis the opportunity of placing any shipment, whether 100 or 1,000 lbs., in this great territory of consumption on a schedule equal to that of the highest class of perishable carload freight. Many a through car is inaugurated that probably in the beginning and perhaps several weeks thereafter does not develop sufficient tonnage to justify the cost, yet the traffic men say to the operating people, 'you must run this car regardless of its tonnage; the shippers will take advantage thereof as soon as they know its advantages.'

"A single St. Louis industry has in no small degree been fostered by superior package car service. I refer to the boot and shoe business. The State Labor Bureau shows that the boot and shoe factories of Missouri furnish employment to more male and female employees than any other industry. St. Louis is the greatest manufacturing and shipping point of boots and shoes in the world.

"The output of St. Louis from 26 factories last year was more than $26,000,000. Elsewhere in Missouri there are 19 boot and shoe factories, mostly near St. Louis. Unquestionably the merits of St. Louis as a distributing point have something to do with this remarkable advance. Great credit is due to the efficient and good service given by the railways in enabling this industry to reach the great West and Southwest, in competition with Eastern or more remote manufacturers. At least 95 per cent. of this enormous traffic moves in less carload shipments. What I have said applies with equal force to stoves, woodenware, furniture, vehicles and hundreds of other articles."

Western Maryland Into Pittsburgh.

A traffic agreement for 99 years has been made between the Western Maryland and the Pittsburgh & Lake Erie, a subsidiary of the New York Central & Hudson River. The contract involves the immediate extension of the Western Maryland line from Cumberland, Md., to a connection with the Pittsburgh & Lake Erie at Connellsville, Pa., and provides for full through traffic arrangements between the two lines, opening lines and terminals of each company to the traffic of the other company and its through connections. The main line of the Pittsburgh & Lake Erie runs from Pittsburgh northwesterly to Youngstown, Ohio. From Pittsburgh south to Connellsville the Pittsburgh & Lake Erie runs over the tracks of the Pittsburgh, McKeesport & Youghiogheny, which it leases. The Western Maryland runs from Baltimore west to Cumberland, and from there southwest to Durbin, W. Va. The new line from Cumberland to Connellsville will apparently be approximately 90 miles long. It is to be single-track, but the grading will be done for double-track. It will be heavy work, costing, it is estimated, between $75,000 and $100,000 a mile. The Western Maryland was taken out of the hands of the receiver and turned over to the present Western Maryland Railway Co. on December 1. The Pittsburgh & Lake Erie is controlled by the New York Central & Hudson River.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF NOVEMBER, 1909.
(See also issues of Jan. 7 and 14.)

Name of road.	Mileage operated at end of period.	Operating revenues: Freight.	Passenger.	Total, inc. misc.	Operating expenses: Maintenance: Way and structures.	Maintenance: Of equipment.	Traffic.	Transportation.	General.	Total.	Net operating revenues (or deficit).	Outside operations. net.	Taxes.	Operating income (or loss).	Increase (or dec.) comp. with last year.
Alabama Great Southern	309	$252,216	$85,410	$368,682	$46,460	$82,616	$9,087	$100,959	$8,323	$247,445	$121,237	—$598	$11,236	$109,403	$39,448
Buffalo & Susquehanna	361	173,302	17,796	201,185	32,055	55,389	1,828	81,289	8,431	178,992	22,193	—26	4,000	18,167	—831
Central New England	278	260,816	25,068	299,749	59,095	23,834	1,215	70,117	2,842	157,103	142,646	....	6,500	136,146	21,938
Central of Georgia	1,916	738,662	277,237	1,117,426	142,204	159,506	29,736	320,394	42,917	694,757	422,669	6,572	55,200	374,041	74,702
Central Vermont	411	224,227	77,067	323,146	32,911	53,502	8,491	131,085	7,455	233,444	89,702	157	10,116	79,743	57,915
Chicago & Alton	998	796,502	329,752	1,215,708	145,284	140,330	38,368	397,366	27,555	748,903	466,805	—5,275	32,000	429,530	80,853
Chicago & Erie	269	341,120	73,747	451,935	45,630	88,700	15,884	184,742	9,078	344,034	107,901	....	10,938	96,962	83,301
Chicago, Indiana & Southern	341	296,825	21,841	326,253	46,342	45,805	7,344	102,373	8,411	210,275	115,978	—175	12,500	103,303	45,723
Chicago, Milwaukee & Puget Sound	1,400*	947,458	78,484	1,044,787	31,546	66,731	20,771	307,532	9,691	436,271	608,516	2,975	20,000	591,491	....
Chicago, Milwaukee & St. Paul	7,511	4,476,013	1,048,180	5,956,752	678,381	702,302	109,635	2,272,249	108,793	3,871,360	2,085,392	9,565	206,636	1,888,321	347,905
Cincinnati, New Orleans & Tex. Pac.	337	635,848	125,506	797,744	111,349	140,951	20,740	197,490	16,736	487,266	310,478	795	20,000	291,273	92,331
Cleveland, Akron & Columbus	210	159,159	40,068	211,703	16,436	55,825	2,739	69,855	3,862	148,717	62,986	....	5,000	57,986	3,859
Colorado Midland	337	198,174	27,673	255,253	25,989	29,309	10,274	93,952	5,475	164,999	90,254	—1,091	9,350	79,813	14,988
Cumberland Valley	162	190,892	49,416	251,404	35,642	23,983	3,453	76,266	5,081	144,425	106,979	260	4,083	103,156	—1,549
Duluth & Iron Range	168	820,247	25,642	852,569	121,242	57,314	518	165,812	7,962	352,848	499,721	—84	34,101	465,536	161,951
Duluth, Missabe & Northern	289	1,134,530	35,182	1,177,111	92,025	90,227	1,512	196,900	9,847	390,511	786,600	7,415	48,085	745,930	392,331
Duluth, South Shore & Atlantic	598	171,351	84,847	270,967	36,169	38,121	9,522	103,184	6,191	193,187	77,780	601	16,000	62,381	3,292
Evansville & Terre Haute	310	152,335	49,467	224,219	23,930	36,124	4,588	60,858	6,794	132,294	91,925	—890	8,872	82,163	37,602
Galveston, Harrisburg & San Antonio	1,338	783,860	230,492	1,060,159	117,922	127,537	26,365	353,067	26,220	651,111	409,048	—2,337	28,179	378,532	98,987
Georgia R. R.	307	186,274	82,344	285,735	29,361	40,018	10,204	107,507	6,622	193,711	92,024	....	2,985	89,039	41,192
Georgia Southern & Florida	395	124,995	64,014	220,719	24,457	43,562	5,784	75,816	8,658	158,277	62,442	1,768	11,632	52,578	19,070
Gulf & Ship Island	307	149,070	40,467	201,027	37,772	31,756	1,166	58,261	7,416	136,371	64,656	....	4,852	59,804	15,431
Kanawha & Michigan	175	217,247	26,152	248,030	46,503	54,039	2,051	55,244	3,915	161,752	86,278	—11	6,979	79,288	44,969
Long Island	391	296,314	372,469	701,464	65,193	105,836	13,479	323,498	19,045	527,051	174,413	51,678	33,232	192,859	104,778
Morgan's La. & Tex. R. R. & S. S. Co.	358	447,282	89,400	558,084	55,951	36,803	10,557	174,707	12,784	290,802	267,282	—2,242	16,000	249,040	34,741
New York, Phila. & Norfolk	112	213,919	28,849	260,713	22,568	45,214	2,926	97,613	8,148	176,469	84,244	....	6,250	77,994	14,338
New York, Susquehanna & Western	151	157,670	51,066	233,094	24,892	22,503	1,090	88,678	3,655	140,818	92,276	—9,698	11,317	71,261	7,072
Northwestern Pacific	376	115,540	104,275	240,869	42,960	30,490	2,311	92,133	9,489	177,383	63,486	....	10,581	52,905	28,320
Peoria & Eastern	351	203,658	57,297	280,742	35,994	61,898	5,693	95,626	4,465	203,076	77,666	....	8,800	68,866	5,631
St. Louis & San Francisco	4,726	2,507,560	831,222	3,568,703	665,517	560,643	9,...84	1,198,310	106,318	2,624,472	944,231	....	123,589	820,641	120,940
St. Louis Southwestern	773	561,388	122,207	712,183	105,609	97,928	26,797	147,008	22,403	399,345	312,838	—1,020	23,395	288,423	46,319
St. Louis Southwestern of Texas	697	278,298	68,426	370,265	89,256	66,294	11,508	160,978	16,310	344,346	25,919	—224	8,333	17,362	—49,235
Texas & New Orleans	458	250,405	82,439	353,916	53,774	44,486	6,658	130,783	7,748	243,449	110,467	752	11,600	99,619	40,237
Toledo, St. Louis & Western	451	298,581	34,575	353,044	41,541	45,698	7,015	98,849	9,614	202,717	150,327	.....	12,000	138,327	32,333
Union Pacific	3,384†	3,723,905	909,113	4,993,899	406,367	450,723	107,308	1,123,376	98,661	2,186,435	2,807,464	—4,536	142,175	2,660,752	435,036
West Jersey & Seashore	356	145,940	179,093	352,856	67,615	49,114	11,661	178,840	8,419	315,649	37,207	3,489	20,037	20,659	15,474
FIVE MONTHS OF FISCAL YEAR 1910.															
Alabama Great Southern	309	1,066,718	448,208	1,653,686	193,624	419,448	44,199	470,200	44,693	1,172,166	481,520	—2,354	56,180	422,986	54,672
Buffalo & Susquehanna	361	938,260	111,724	1,085,591	185,115	256,924	10,504	383,816	39,365	875,724	209,867	—116	20,000	189,751	9,329
Central New England	278	1,067,952	161,603	1,288,315	223,321	110,399	7,853	367,891	15,515	724,979	563,336	....	32,500	530,836	176,339
Central of Georgia	1,916	3,412,266	1,323,648	5,174,319	727,029	778,921	149,526	1,474,497	201,420	3,331,393	1,842,926	32,824	238,400	1,637,350	261,979
Central Vermont	411	1,041,756	541,837	1,693,611	217,470	244,380	41,970	637,052	34,302	1,175,174	518,437	5,197	50,583	473,051	202,756
Chicago & Alton	998	3,736,151	1,921,989	6,110,378	721,618	616,953	200,480	1,830,428	142,832	3,512,311	2,598,067	—6,407	160,000	2,431,660	54,247
Chicago & Erie	269	1,574,069	371,487	2,113,849	286,087	438,121	76,999	842,357	45,223	1,688,787	425,062	....	54,693	370,369	168,322
Chicago, Indiana & Southern	341	1,310,992	125,736	1,470,695	265,265	243,510	43,680	473,659	39,928	1,066,042	404,653	648	62,500	342,801	168,624
Chicago, Milwaukee & Puget Sound	1,400*	3,131,159	358,646	3,548,756	114,354	193,782	82,231	981,564	46,813	1,418,744	2,130,012	17,121	80,000	2,067,133	.....
Chicago, Milwaukee & St. Paul	7,511	20,575,674	6,880,723	29,567,440	4,246,772	3,412,992	558,760	10,481,062	472,907	19,172,493	10,394,947	164,162	1,033,163	9,525,946	—286,739
Cincinnati, New Orleans & Tex. Pac.	337	2,858,293	650,010	3,684,756	434,538	712,635	95,496	996,522	87,611	2,326,802	1,357,954	844	100,000	1,258,798	309,566
Cleveland, Akron & Columbus	210	767,621	238,947	1,073,815	153,387	250,568	14,779	331,582	18,641	768,957	304,858	....	25,000	279,858	3,528
Colorado Midland	337	787,117	199,305	1,122,728	149,139	164,070	50,605	443,309	27,463	834,586	288,142	—562	46,750	240,830	346
Cumberland Valley	162	897,084	285,638	1,234,555	166,841	113,346	19,484	345,033	27,203	671,907	562,648	2,666	20,418	544,896	51,405
Duluth & Iron Range	168	6,189,053	106,699	6,336,973	527,187	316,627	1,767	902,423	42,727	1,790,731	4,546,242	25,243	253,876	4,317,609	1,294,259
Duluth, Missabe & Northern	289	8,520,677	180,171	8,743,007	517,304	513,801	7,785	1,029,003	50,484	2,118,377	6,624,630	33,358	355,733	6,302,255	1,619,287
Duluth, South Shore & Atlantic	598	947,517	462,498	1,483,377	235,377	149,825	47,374	518,136	34,269	984,981	498,396	6,742	80,000	425,138	143,972
Evansville & Terre Haute	310	714,529	268,805	1,085,998	121,088	138,821	25,749	296,938	33,547	616,143	469,855	—4,215	44,360	421,280	105,132
Galveston, Harrisburg & San Antonio	1,338	3,236,720	1,051,722	4,506,729	551,448	620,952	116,361	1,607,397	135,431	3,031,589	1,475,140	—17,033	140,895	1,317,212	19,470
Georgia R. R.	307	875,238	352,129	1,298,539	169,119	194,345	47,459	488,480	34,886	934,289	364,250	....	10,089	354,161	141,592
Georgia Southern & Florida	395	541,996	297,401	957,714	105,586	190,753	27,884	333,615	42,151	699,989	257,725	8,239	43,897	222,067	30,225
Gulf & Ship Island	307	655,213	188,820	899,630	168,266	149,078	5,998	259,350	36,196	618,888	280,742	.....	24,260	256,482	107,698
Kanawha & Michigan	175	1,018,509	144,879	1,185,155	225,307	239,683	11,062	276,887	19,775	772,714	412,441	—97	34,662	377,682	118,314
Long Island	391	1,350,911	2,911,016	4,453,841	420,744	524,696	84,849	1,663,046	89,217	2,782,552	1,671,289	466,453	166,162	1,971,579	487,926
Morgan's La. & Tex. R. R. & S. S. Co.	358	1,441,841	459,308	2,007,277	261,409	240,422	49,874	690,767	63,261	1,305,733	701,544	—5,557	80,000	615,987	150,268
New York, Phila. & Norfolk	112	1,142,786	182,509	1,420,006	129,778	229,576	16,661	483,320	42,961	902,296	517,711	.....	31,250	486,460	119,742
New York, Susquehanna & Western	151	727,673	284,367	1,127,149	148,595	108,318	7,583	408,800	19,605	692,901	434,248	—30,391	56,583	347,273	2,086
Northwestern Pacific	376	637,536	787,340	1,533,706	250,941	165,980	12,954	486,884	47,293	964,052	569,654	....	52,905	516,749	93,602
Peoria & Eastern	351	989,248	321,149	1,407,091	165,861	226,355	26,783	470,853	24,889	914,741	492,350	....	44,000	448,350	106,518
St. Louis & San Francisco	4,726	11,483,084	4,541,177	17,230,043	2,864,490	2,674,755	392,356	5,550,598	455,393	11,937,592	5,292,451	—3,952	565,709	4,726,742	721,728
St. Louis Southwestern	773	2,462,583	591,541	3,181,308	369,649	457,653	119,349	686,489	105,726	1,738,866	1,442,442	—895	108,697	1,329,793	262,027
St. Louis Southwestern of Texas	697	1,164,438	399,515	1,675,301	364,171	342,448	46,083	637,112	76,305	1,466,119	209,182	7,865	41,006	166,621	70,061
Texas & New Orleans	458	1,123,966	416,268	1,632,729	226,119	244,064	31,808	593,571	44,569	1,140,132	492,597	....	58,000	442,462	106,119
Toledo, St. Louis & Western	451	1,346,445	213,176	1,658,122	199,230	235,782	33,200	494,600	41,812	1,004,624	653,498	....	60,000	593,498	91,527
Union Pacific	3,384†	17,156,043	5,090,136	24,122,947	2,367,530	2,063,059	596,675	5,115,926	479,212	10,622,402	13,500,545	12,602	637,875	12,875,272	1,557,582
West Jersey & Seashore	356	738,181	1,931,806	2,853,172	389,181	290,024	80,979	1,004,017	42,480	1,806,681	1,046,491	16,678	100,185	962,984	139,306

*Began operations on Aug. 1, 1909. †Mileage operated Nov. 30, 1908—3,309. —Indicates deficits, losses and decreases.

Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association, in presenting statistical bulletin No. 63, giving a summary of car shortages and surpluses by groups from August, 19, 1908, to January 5, 1910, says:

"The grand total figures given in this bulletin show a decrease in the surplus of 6,045, and in the shortage of 10,161, but as will be noted by the group totals, the general situation indicates a lessened demand for cars. This apparent contradiction is due to the fact that the showing made by the grand totals hardly indicates the true condition, as two important roads in group 6 (Northwestern) failed to get their reports to the committee in time for incorporation in the bulletin.

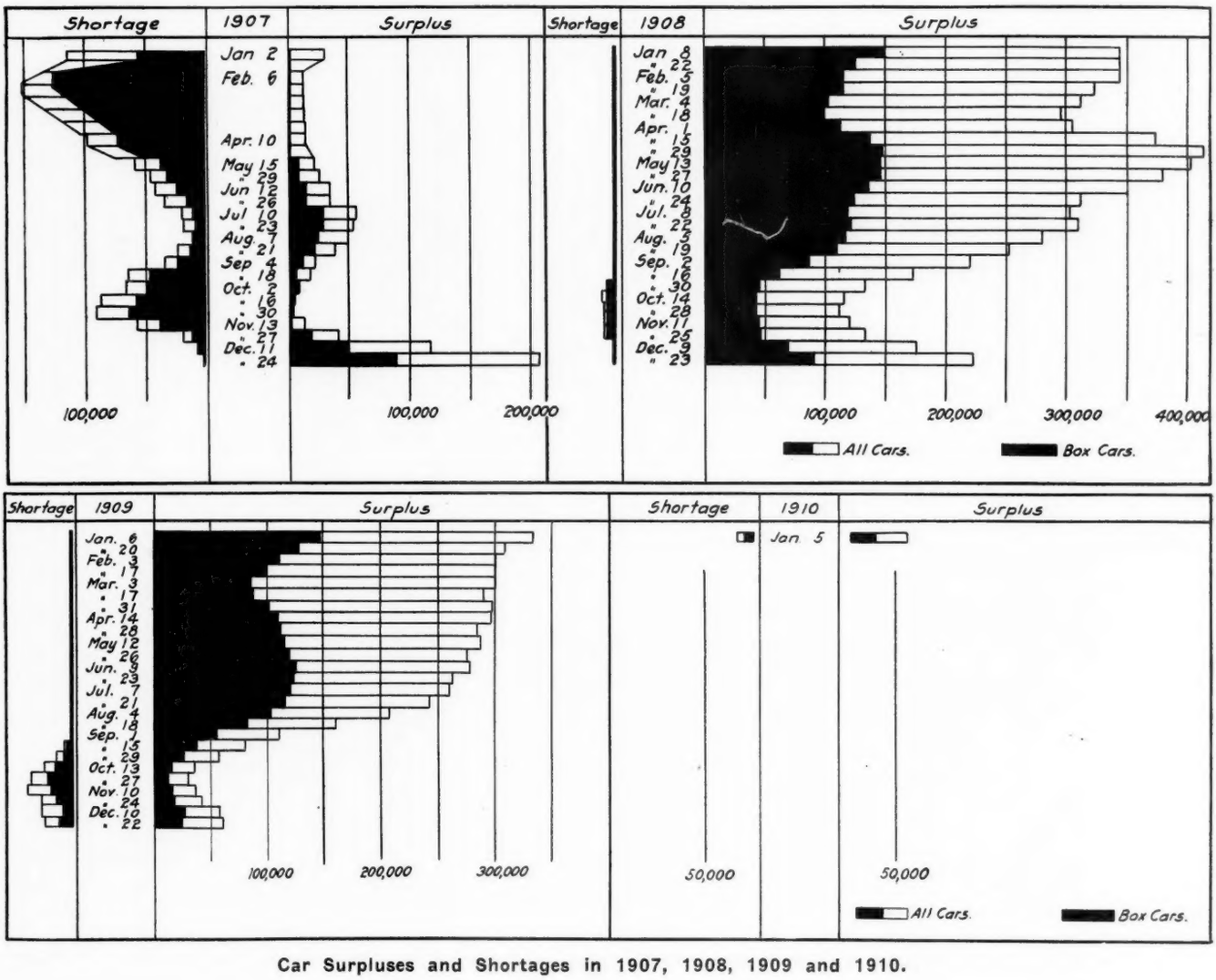
"Aside from group 6, the figures of which cannot be used for comparison, the only group that shows a decrease in the surplus is group 11 (Canadian). This group also shows a slight increase in shortage, being the only one failing to show a decrease in this item. The most notable change in conditions is in group 4 (North Atlantic), where a surplus of 1,482 and a shortage of 8,680 in our last report is changed to a surplus of 7,131 and a shortage of 1,476. This is due apparently to a general slackening of business on the tidewater coal roads lying in that group."

The accompanying table gives the car surpluses and short-

CAR SURPLUSES AND SHORTAGES.

Group*	Date.	Number of roads.	Surpluses. Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Shortages Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
1	January 5, 1910	8	.....	1,658	238	59	1,955	530	.....	28	54	612
2	" 5, 1910	23	1,494	240	1,181	482	3,397	10	.....	2,081	23	2,114
3	" 5, 1910	22	396	358	652	1,651	3,057	1,523	50	1,751	974	4,298
4	" 5, 1910	10	3,767	596	2,069	699	7,131	1,127	14	335	....	1,476
5	" 5, 1910	21	907	507	482	741	2,637	277	200	535	....	1,012
6	" 5, 1910	19	3,152	498	1,902	2,121	7,673	3,229	35	109	193	3,566
7	" 5, 1910	4	280	122	414	785	1,601	...	...	...	....	.....
8	" 5, 1910	14	3,834	384	979	1,168	6,365	24	2	...	3	29
9	" 5, 1190	10	2,344	361	358	441	3,504	6	35	...	92	133
10	" 5, 1910	18	4,251	1,591	1,907	3,944	11,693	188	8	43	....	239
11	" 5, 1910	5	414	2,136	22	724	3,296	390	...	24	....	414
Grand total		154	20,839	8,451	10,204	12,815	52,309	7,304	344	4,906	1,339	13,893

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin, Minnesota, and North and South Dakota lines; Group 7—Montana, Wyoming and Nebraska lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Oregon, Idaho, California, and Arizona lines; and Group 11—Canadian lines.



Car Surpluses and Shortages in 1907, 1908, 1909 and 1910.

ages by groups and the chart shows the total surpluses and shortages bi-weekly in 1907, 1908, 1909 and 1910.

Traffic Club of Chicago.

The annual dinner of the Traffic Club of Chicago will be held at the La Salle Hotel on Tuesday, February 8. The speakers will include U. S. Senator A. B. Cummins of Iowa; Edward Bancroft, general counsel of the International Harvester Company, and Warren J. Lynch, passenger traffic manager of the New York Central Lines. Col. J. S. Taylor, U.S.A., addressed the club on January 18 on the subject "Safe Transportation of Explosives and Other Dangerous Articles."

INTERSTATE COMMERCE COMMISSION.

Icing Charges Reduced.

California Fruit Growers' Exchange v. Santa Fe Refrigerator Despatch Co. et al. Opinion by Commissioner Lane.

Defendants required to maintain in their refrigeration tariffs for two years a rule providing that no charge over the regular refrigeration rate will be made on cars iced before loading at regular icing stations in California and Arizona and set for loading inside switching limits at such points. (17 I. C. C., 404.)

Reduction in Grain Rates to Astoria.

Farmers' Co-operative & Educational Union v. Great Northern et al. Astoria Chamber of Commerce v. same. Opinion by Commissioner Clark.

The commission is asked to establish joint through rates on grain and grain products from producing points in Washington, Oregon and Idaho to Astoria, Ore., the same as the rates to Portland, Ore., and Seattle, Wash., and Tacoma. The fact that defendants have provided themselves with tracks, warehouses, wharves, etc., for handling export grain at Portland, Seattle and Tacoma does not impose on them the obligation of duplicating those facilities at Astoria. However, defendants' rates on grain and grain products from points in Washington and Idaho to Astoria are unreasonable *per se*, and rates shall be established to Astoria not more than 4½ cents per 100 lbs. higher than the rates to Portland. (17 I. C. C., 406.)

Orders for Cars Should be in Writing.

Pope Manufacturing Co. v. Baltimore & Ohio et al. Opinion by Commissioner Harlan.

The petitioner's claim that it ordered cars of definite length for the shipments involved in these complaints is denied by the defendant, and the conflict of testimony is such as to give the commission no clear ground for holding that such demands were in fact made.

In view of the confusion that not infrequently follows the absence of a written record of a demand for a car of specific length for a particular movement, shippers are cautioned to give their orders for equipment in writing or promptly to confirm the orders in writing when given verbally. (17 I. C. C., 400.)

Discrimination in Passenger Service.

Loch Lynn Construction Co. v. Baltimore & Ohio. Opinion by Commissioner Clements.

A carrier cannot justify unreasonable discrimination between localities in refusing to stop its passenger trains at a particular place on certain days by a contract not to do so. A controversy involving a question of such discrimination must be determined independent of the contract.

In the performance of its passenger service a carrier operates in a wide field of reasonable discretion in the adaptation of its service to the infinite variety of circumstances and conditions confronting it. Only such resulting discriminations as are undue and unreasonable are forbidden.

The failure of the defendant carrier to stop its passenger trains at Mountain Lake Park, Md., a station on its line, is not found to be unreasonable discrimination in view of all the facts, circumstances and conditions appearing. (17 I. C. C., 396.)

STATE COMMISSIONS.

The Louisiana Railway Commission has fined the Texas & Pacific $250 for violating the regulations of the commission by failing to have lights in its waiting room at New Roads, La., on the night of November 24, 1909, between 8:45 and 9:30 p.m.

The New York State Public Service Commission, First district, has directed the Interborough Rapid Transit Company to put destination signs on every subway car, at each end and on opposite sides, so that they may be seen from the platforms and the inside of the cars. The order must be obeyed by February 1. The company has also been directed to provide at each station a map of the entire subway system, indicating the streets adjacent to every station.

Indiana: Headlights.

The order of the Indiana State Railroad Commission, requiring all railways in that state to have their locomotives equipped with headlights of 1,500 candle power, was noticed in our last issue, page 108, and the language of our note was copied, correctly, from the official document, but the title, indicating that electric headlights would be required, was wrong. The order does not specify what kind of lights shall be used. As a matter of fact, acetylene headlights are already in use on the railways of Indiana. The Indianapolis Southern has just given an order for acetylene lights.

D. F. Jurgenson, who has been in the employ of the Minnesota Railroad and Warehouse Commission for the last five years, has been appointed engineer for the commission. His duties will cover all work pertaining to the engineering department of the commission, the most important part of which is the continuation of the valuation of railway properties. The physical valuation of railway properties in Minnesota was completed some years ago, but it has been found necessary to continually keep this valuation up to date. Mr. Jurgensen is a graduate of the engineering school of the Minnesota University. After graduation he began railway work in 1890 in the office of the county surveyor in Minneapolis. He was later connected with the bridge engineering department of the city, and in 1895 he was appointed assistant engineer on the Minneapolis & St. Louis. He was later employed in the engineering department of the Chicago Great Western, remaining there until 1904, when he was appointed first assistant to D. C. Morgan, then in charge of valuation of railways for the Minnesota commission.

D. F. Jurgensen.

COURT NEWS.

The supreme court of Michigan has ruled that the mechanics' lien law is not to apply to the construction of railways, and the builders of a power house for the Detroit, Flint & Saginaw Railroad have no valid lien upon the property.

Suit was filed in the United States circuit court at Chicago on January 15 by Fred W. Smith, a stockholder, to restrain the Northern Trust Company from complying with the pro-

visions of the federal corporation tax law. The avowed purpose of the litigation is to test the constitutionality of the law.

Judge Humphrey, of the United States circuit court, on June 15 overruled a demurrer by Attorney-General Stead, of Illinois, in the suit of the Chicago, Peoria & St. Louis at Springfield, Ill., involving the constitutionality of the Illinois 2-cent fare law. The attorney-general contended that the federal court did not have jurisdiction and that the road had not made a prima facie showing that the 2-cent fare is confiscatory.

In the circuit court at Cleveland, Ohio, this week, the litigation between the city of Cleveland and certain railway companies in regard to the ownership of a tract of 40 acres of land on the lake front was decided in favor of the city, the decision of the lower court having been confirmed. The railways will appeal the case to the supreme court of the United States.

Judge Carland, of the federal court, on January 13 issued an order temporarily restraining the South Dakota Railway Commission from enforcing an order issued by it on December 15 requiring Wells, Fargo & Company, the Adams Express Company and the American Express Company to reduce their rates. The companies were ordered to adopt a distance schedule framed by the commission. Judge Carland will give a hearing in the case on January 25.

The supreme court of Missouri has issued a writ prohibiting the Audrain county circuit court from proceeding with the suit filed in it by which it is sought to invalidate bonds and stock issued by the Wabash in 1906. The suit in question was filed by the Continental Securities Company of New Jersey and Clarence H. Venner, holders of $50,000 of debenture mortgage bonds issued in 1889. The complainants allege that the holders of the 1889 bonds, of which it is stated $30,000,000 were issued, were to be permitted, with the stockholders, to elect 12 directors, and that these directors were to choose the president. They allege that the directors of the Wabash failed to set aside any of the net income of the company in Missouri for the payment of interest on the old bonds, and that, therefore, the conditions under which this mortgage was given were violated. They charge that a meeting of the stockholders in 1906, when it was voted to issue $200,000,000 in bonds and to retire all outstanding indebtedness, including the issue of debenture mortgage bonds referred to, was irregular, and they ask the court to restrain the Wabash from setting aside any of its earnings to pay the interest on the new bonds. The attorneys for the Wabash in their petition to the supreme court for a writ of prohibition against the Audrain county circuit court said that if the suit was decided in favor of the complainants a cloud would be thrown upon the validity of $50,000,000 of bonds already issued and in the hands of innocent holders. The writ was made returnable at the April term of the supreme court.

The supreme court of the United States has declared invalid the laws of Kansas, known as the Bush act, which sought to compel outside corporations to pay a charter fee for the benefit of the state schools as a condition of doing business in that state. The decision is by a divided court. The controlling opinion is by Justice Harlan, with concurring opinion by Justice White, Chief Justice Fuller and Associate Justices Holmes and McKenna dissent. The case was that of the Western Union Telegraph Company, plaintiff in error, vs. the state of Kansas. The Western Union has fought the law on the grounds of acquired rights and that the law was unconstitutional, as seeking to impose a burden upon interstate commerce. Justice Harlan declares that "the statutory requirement of a given per cent. of the authorized capital of a telegraph company which represented all its business interests and property inside and out of the state was, in its practical operation, a burden on interstate commerce and a tax on property beyond the limits of Kansas."

In the dissenting opinion, Justice Holmes declared that the state had not undertaken to tax the Western Union, but simply had fixed the condition on which the company could transact state business within the state. "If the license fee is more than the local business will bear it can stop that business and avoid the fee." Justice White concurred in the finding of the majority, but for different reasons, and read an opinion outlining his view.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

O. C. Van Zandt, auditor of the Gulf & Interstate, with office at Galveston, Tex., has resigned.

H. P. McMillan has been appointed auditor of the Texas State Railroad, with office at Palestine, Tex.

H. E. Byram, assistant to second vice-president of the Chicago, Burlington & Quincy, at Chicago, has been appointed assistant to the vice-president.

W. H. Biggar, general solicitor of the Grand Trunk and the Grand Trunk Pacific, at Montreal, Que., has been appointed general counsel of both these companies, and his former position has been abolished.

H. C. Ansley has been appointed treasurer of the Georgia, Southern & Florida, with office at Washington, D. C., succeeding B. C. Smith, deceased. W. P. Hopper, purchasing agent at Macon, Ga., has been appointed local treasurer and assistant secretary, with office at Macon.

Gordon Campbell, vice-president and general manager of the York Railways (Electric) at York, Pa., has been elected president, succeeding W. F. Bay Stewart. Mr. Stewart will continue as a member of the board of directors, also as a member of the executive committee. Lewis C. Meyer, chief engineer, succeeds Mr. Campbell.

A. D. McDonald, whose appointment as auditor of the Southern Pacific and the Corvallis & Eastern at San Francisco, Cal., was announced in the *Railway Age Gazette* in its issue of Jnuary 7, page 72, was born April 14, 1878, at Oakland, Cal. He finished his education at Notre Dame University and began railway work January 8, 1901, with the Galveston, Harrisburg & San Antonio at Houston, Tex. He was then consecutively clerk at Houston, chief clerk of the Southern Pacific at San Francisco, head clerk of accounts with the various Harriman lines at San Francisco and auditor of the Los Angeles Pacific Company at Los Angeles. In December, 1908, he was made auditor of the Pacific Electric Railway, from which position he has just been promoted.

Operating Officers.

T. T. Clark has been appointed superintendent of the Texas State Railroad, with office at Palestine, Tex.

W. W. Ryder, superintendent of telegraph of the Chicago, Burlington & Quincy, at Chicago, has been appointed general superintendent of telegraph of the New York Central lines west of Buffalo, with office at Chicago.

F. M. Luce, auditor of car accounts of the Chicago & North Western at Chicago, having been retired under the pension rules of the company, his duties will be performed by Edward E. Betts, car service agent, with office at Chicago.

O. Cornelisen having resigned as general superintendent of the Chicago Great Western at Chicago, that office is abolished, and the duties heretofore performed by the general superintendent will be assumed by H. J. Slifer, general manager.

R. C. Ten Eyck has been appointed superintendent of the Third division of the Denver & Rio Grande, with office at Gunnison, Colo., succeeding O. J. Ogg, who retains the superintendency of the Second division, with office at Salida, Colo. The office of assistant superintendent of the Third division has been abolished.

Frederick Ely Williamson, whose appointment as assistant superintendent of the Mohawk division of the New York Central & Hudson River at Albany, N. Y., was recently announced in these columns, was born in 1876 at Cleveland, Ohio. Mr. Williamson is a graduate of Yale University, and began railway service in September, 1898, as a clerk in the superintendent's office at Albany, N. Y. In April, 1899, he was made freight claim agent at Albany and the following January

agent at Rome. In July, 1901, he was transferred to Utica as agent, and in April, 1902, was again transferred in the same capacity to Troy. Later he was transferred as chief clerk to the superintendent of freight transportation at New York, and was then appointed car accountant. He was made assistant superintendent of the Harlem division in December, 1906, and appointed superintendent of freight terminals at Albany in August, 1907, which position he held at the time of his recent promotion.

Eugene H. Coapman, whose appointment as general manager of the Southern Railway, with office at Washington, D. C., was recently announced in these columns, was born on August 11, 1865, in Wisconsin. He began railway work on the Chicago, Milwaukee & St. Paul when he was 15 years old. From 1880 to 1883 he was operator and train despatcher, and then went to the Iowa Central as train despatcher. After serving as chief despatcher and superintendent of telegraph he returned to the Chicago, Milwaukee & St. Paul in 1887 as train despatcher. In 1890 he went to the Illinois Central in the same capacity, and was later made chief train despatcher and finally terminal freight trainmaster, leaving that company in 1900 to go to the Atchison, Topeka & Santa Fe as trainmaster. Two years later he went to the Southern as superintendent of the Danville division. In December, 1905, he was made assistant general superintendent of the Eastern district, and in November, 1906, was made general superintendent of the Northern district; about a year later was appointed manager of the Northern and Eastern districts, and later was made manager of the Southern Railway. He is now general manager in charge of the operating and maintenance departments.

E. H. Coapman.

In connection with the promotion of W. N. Bannard and C. T. Dabney, division superintendents of the Philadelphia, Baltimore & Washington to the staff of the general manager of the Pennsylvania Railroad as special agents, the following appointments have been made: A. J. Whitney, Jr., superintendent of the Delaware division of the Philadelphia, Baltimore & Washington, at Wilmington, Del., has been appointed superintendent of the Maryland division, with office at Wilmington, succeeding Mr. Bannard. E. B. John, principal assistant engineer at Wilmington, succeeds Mr. Whitney. A. B. Clark, division engineer of the Maryland division at Wilmington, succeeds Mr. John. J. J. Rhoads, division engineer of the Philadelphia Terminal division of the Pennsylvania at West Philadelphia, Pa., succeeds Mr. Clark. William F. Greene, supervisor of the P., B. & W. at Washington, D. C., succeeds Mr. Rhoads. N. W. Smith, division engineer of the Middle division of the Pennsylvania at Altoona, has been appointed superintendent of the Central division of the P., B. & W., succeeding C. T. Dabney. J. C. Auten, division engineer of the West Jersey & Sea Shore at Camden, N. J., succeeds Mr. Smith, and J. B. Hutchinson, Jr., supervisor at Altoona, succeeds Mr. Auten.

Traffic Officers.

H. Wallace, local freight agent of the Canadian Pacific at Winnipeg, Man., has been appointed general freight agent at Fort William, Ont.

R. B. Hackney has been appointed a commercial agent of the Cincinnati Northern, with office at Cincinnati, Ohio, succeeding J. R. Davidson, resigned.

W. L. Lighthart has been appointed a traveling freight agent of the Chicago Great Western, with office at St. Paul, Minn., succeeding T. H. Hughes, resigned.

E. G. Mustain has been appointed a traveling freight and passenger agent of the El Paso & Southwestern and the Morenci Southern, with office at El Paso, Tex.

W. S. Weber, traveling passenger agent of the Great Northern at Spokane, Wash., has been appointed traveling passenger and immigration agent, with office at Chicago.

I. M. Keller has been appointed a traveling passenger agent of the Missouri Pacific, with office at Chicago, succeeding J. F. Govan, resigned to accept service elsewhere.

F. L. Lewis, traveling auditor of the St. Louis, Brownsville & Mexico at Kingsville, Tex., has been appointed commercial agent, with office at Corpus Christi, Tex. M. M. Smith succeeds Mr. Lewis.

J. B. Muckle, traveling passenger agent of the Wabash at Denver, Colo., has been appointed city ticket agent, with office at Chicago, succeeding N. C. Keeran, resigned to engage in other business.

J. P. Baker has been appointed a traveling freight agent and P. A. Greening has been appointed a soliciting freight agent of the Chicago, Rock Island & Pacific, both with office at Fort Worth, Tex.

E. T. Steele, assistant general freight agent of the Seaboard Air Line at Birmingham, Ala., has been appointed freight traffic manager of the Alabama Great Southern, with office at Birmingham, succeeding L. Sevier.

Charles E. Perkins, assistant general freight agent of the St. Louis, Iron Mountain & Southern at St. Louis, Mo., has been appointed general freight agent, with office at St. Louis, succeeding J. P. Burnett, assigned to other duties.

J. W. Harper, traveling passenger agent of the San Pedro, Los Angeles & Salt Lake at Chicago, has been appointed a traveling passenger agent of the Denver & Rio Grande, with office at St. Louis, Mo., succeeding A. B. Ayers, promoted.

E. L. Mountford, contracting freight agent of the Illinois Central at Birmingham, Ala., has been appointed a traveling freight agent, with office at Birmingham, succeeding Willis Hitzing, transferred. O. F. Redd succeeds Mr. Mountford.

Daniel C. Fisk, Jr., traveling freight agent of the Union Pacific, the Oregon Short Line and the Oregon Railroad & Navigation Co., at New York, has been transferred to Philadelphia, Pa. George J. Needham succeeds Mr. Fisk, with office at New York.

E. A. Cousino, traveling passenger agent of the West Shore, at Chicago, has been appointed general Western passenger agent, with office at Chicago, succeeding Neil Mooney, promoted. M. P. Marsh, city passenger agent at Toledo, Ohio, succeeds Mr. Cousino.

E. D. Forde has been appointed a traveling passenger agent of the St. Louis & San Francisco, with office at Pittsburgh, Pa. J. B. Gibson has been appointed a traveling freight agent and H. H. Scott has been appointed a soliciting freight agent, both with office at Houston, Tex.

H. M. Baker has been appointed a commercial agent of the Grand Trunk (Portland route) and the Central Vermont (New London route). He will also represent the National Despatch fast freight line, the Great Eastern fast freight line and the Canada-Atlantic Transit Co., with office at New York.

C. B. Condon, assistant general freight agent of the Minneapolis & St. Louis and the Iowa Central at Minneapolis, Minn., has been appointed general agent in the traffic department of the Toledo, St. Louis & Western, the Chicago & Alton, the Minneapolis & St. Louis and the Iowa Central, with office at San Francisco, Cal.

E. J. Naylor, general agent of the Toledo, St. Louis & Western and the Chicago & Alton at Los Angeles, Cal., has had

his jurisdiction extended over the Minneapolis & St. Louis and the Iowa Central. R. M. Jenks, commercial agent of the Minneapolis & St. Louis at Los Angeles, has been appointed traveling freight agent of all four roads, with office at Los Angeles.

Charles H. Gattis, whose appointment as general passenger agent at Augusta, Ga., of the Georgia & Florida, was recently announced in these columns, entered the service of the Seaboard Air Line at Raleigh, N. C., about 19 years ago as office boy. Mr. Gattis has since that time been consecutively city ticket and passenger agent in Raleigh, traveling passenger agent, and at the time of his appointment was district passenger agent of the same company.

T. B. Akridge, whose appointment as general freight agent at Augusta, Ga., of the Georgia & Florida, was recently announced in these columns, has been in railway service for about 15 years. He was with the Central of Georgia at Atlanta, Ga., and then with the Southern Freight Association. He next went to the Southern Railway in the general freight department, and for the past three years has been chief clerk in the traffic department of the Georgia & Florida.

H. E. Lounsbury, general agent in the freight department of the Southern Pacific Company, the Oregon Railroad & Navigation Company and the Oregon & Washington at Portland, Ore., has been appointed district freight agent of the Southern Pacific Company, with office at Portland, succeeding C. A. Malboeuf, resigned. C. H. Dexter, contracting freight agent at Portland, succeeds Mr. Lounsbury. H. C. Oliver, traveling freight agent of the Oregon Railroad & Navigation Company at Portland, has been transferred to Spokane, and F. R. Dunn succeeds Mr. Oliver.

Gentry Waldo, whose appointment as assistant general freight agent of the Galveston, Harrisburg & San Antonio, the Houston & Texas Central, the Houston, East & West Texas and the Houston & Shreveport, with office at Houston, Tex., has been announced in these columns, was born in Houston September 26, 1874. He finished his education at Yale University and began railway work in 1896 with the Houston & Texas Central. He was then consecutively traveling freight agent at Nashville, Tenn., and later at Houston; division freight agent at Austin, Tex.; general agent of the Galveston, Harrisburg & San Antonio at El Paso, Tex., and then at Galveston, Tex. In November, 1909, he was made general agent of the Southern Pacific Steamship Lines, with office at Galveston, from which position he has just been promoted.

Engineering and Rolling Stock Officers.

H. F. Smith has been appointed a master car builder of the Chicago & Alton, with office at Bloomington, Ill.

J. Murrin has been appointed superintendent of locomotive shops of the Chicago & North Western, with office at Chicago, succeeding Oscar Otto, resigned.

H. P. Johns, chief draftsman of the St. Louis & San Francisco at Springfield, Mo., has been appointed mechanical engineer, with office at Springfield, Mo.

R. S. Miller, general foreman car department of the New York, Chicago & St. Louis, at Cleveland, Ohio, has been appointed master car builder and his former title has been abolished.

J. E. O'Brien, mechanical engineer of the Northern Pacific at St. Paul, Minn., has been appointed superintendent of motive power of the Western Pacific, with office at San Francisco, Cal.

E. W. Kolb, engineer of electric signals of the Chicago, Rock Island & Pacific, at Chicago, has resigned, to become signal engineer of the Buffalo, Rochester & Pittsburgh, at Rochester, N. Y.

C. E. Allen, master mechanic of the Montana division of the Northern Pacific at Livingston, Mont., has been appointed general master mechanic of the Yellowstone, Montana and Rocky Mountain divisions, with office at Livingston. R. P. Blake succeeds Mr. Allen.

R. A. Rutledge, division engineer of the Gulf, Colorado & Santa Fe at Cleburne, Tex., has been appointed grand division engineer of the Gulf lines, with office at Galveston, Tex. This is a new office and Mr. Rutledge has special charge of maintenance and betterments, under the general supervision of F. Merritt, chief engineer, and all division engineers will report direct to him.

Alfred P. Prendergast, assistant master mechanic at the Mt. Clare shops of the Baltimore & Ohio, at Baltimore, Md., has been appointed master mechanic, succeeding C. T. Turner, retired, after 47 years' service in the same shops. Mr. Prendergast entered the service of the Baltimore & Ohio as an apprentice in 1885 at Wheeling, W. Va., and after completing his apprenticeship he was engaged in the steel industry in the Pittsburgh and Youngstown districts. Several years later he returned to the Baltimore & Ohio as gang foreman at Benwood, W. Va., and then became machine shop foreman at Cumberland, Md., where he also served as roundhouse foreman. He was later made general foreman of locomotive and car repairs and then promoted to division master mechanic at Grafton. Two years later he was transferred to the Baltimore and Philadelphia divisions as master mechanic, with office at Riverside, Baltimore, leaving that position two years later to go to the Mt. Clare shops at Baltimore, as assistant master mechanic, which position he held at the time of his recent appointment.

Purchasing Officers.

J. T. Andrus has been appointed purchasing agent of the North Coast Railroad, with office at Spokane, Wash.

J. H. Palmer has been appointed purchasing agent of the Georgia, Southern & Florida, with office at Macon, Ga., succeeding W. P. Hopper, promoted.

Special Officers.

Frederick N. Pease, assistant chemist of the Pennsylvania Railroad, at Altoona, Pa., has been appointed chemist, succeeding Dr. Charles B. Dudley, deceased.

OBITUARY.

Clifford Buxton, chief engineer of the Toledo & Ohio Central and the Zanesville & Western, with office at Toledo, Ohio, died at his home in Toledo on January 12 after an illness of about five weeks. Mr. Buxton was born on June 15, 1844, at Warren, Me. He graduated from the Rensselaer Polytechnic Institute at Troy, N. Y., and entered railway work in 1865, and in 1866 was a rodman on the Troy & Boston, now a part of the Boston & Maine. From 1866 to 1867 he was division engineer of the Allegheny Valley, now a part of the Pennsylvania Railroad, and in 1867 he became the principal assistant engineer of the Knox & Lincoln, now a part of the Maine Central, leaving that position in 1871 to become an assistant engineer in the service of the United States. The same year he was appointed principal assistant engineer on the Cleveland, Mount Vernon & Delaware, now a part of the Pennsylvania Lines West. From 1875 to 1879 he was principal assistant engineer of the Scioto Valley, now a part of the Norfolk & Western, leaving that position to become principal assistant engineer of the Ohio Central, now the Toledo & Ohio Central. In 18881 he was appointed chief engineer of the Toledo & Ohio Central and the Zanesville & Western.

Clifford Buxton.

Railway Construction.

New Incorporations, Surveys, Etc.

Boston & Maine.—An officer writes that a number of changes are under consideration to be made in Salem, Mass. The grade crossings at North, Mill and Bridge streets will probably be abolished and revision work in the tunnel carried out to provide two tracks in place of the existing single track. No details have been prepared, although it is expected that an appropriation of $2,000,000 will be necessary to carry out the work. On the Western division, between Newmarket, N. H., and Madbury, a long tangent will be substituted for several existing curves and a double-track provided, saving about one-eighth mile in distance, 140 deg. of curvature, and 10 ft. of rise and fall. The grades will be reduced from 40 ft. to 26 ft. per mile. On the Gloucester branch second track will be extended from West Gloucester station, Mass., across the Squam river to the east end of Gloucester yard. A new drawbridge will be provided, also a new station at Gloucester, and the grade crossing at Washington street will be eliminated. The company is also planning to put up new stations at Keene, N. H.; at Charlemont, Mass., and at Shelburne Falls. (Jan. 14, p. 113.)

Buffalo, Rochester & Eastern.—The New York Public Service Commission, Second district, has granted a rehearing in the matter of this company's application for a certificate of public convenience and necessity, and for permission to begin construction on the line from Buffalo, N. Y., east to Rochester, thence to Troy, about 300 miles. A former application for such certificate and permission was denied by the commission in March, 1909. (March 26, p. 726.)

Chesapeake & Ohio.—Surveys, it is said, are being made by this company between Charlottesville, Va., and Orange. It is understood that the company is planning to double-track this section of the road.

Chicago, Bloomington & Peoria (Electric).—Incorporated in Illinois, with a capital of $25,000, to build a line to connect Chicago, Bloomington and Peoria. The incorporators include: C. S. Sollars, F. M. Capp and A. A. Hyde, all of Chicago, and V. L. Garnett, Highland Park, Ill.

Chicago, Milwaukee & Puget Sound.—Contract is said to have been let recently for a 20-mile extension of the Tacoma Eastern south from Glenavon, in the state of Washington. (Dec. 17, p. 1214.)

Corvallis & Eastern.—This company has projected an extension from Yaquina, Ore., west to Newport, five miles.

Des Chutes Railroad.—See Oregon Trunk Line.

Estacado & Gulf.—An officer is quoted as saying that this road will build and put in operation 100 miles of line during 1910 from Roby, in Fisher county, Tex., west. W. A. Butts, president, and T. H. Landon, chief engineer, both of Roby.

Fort Smith & Western.—An officer writes that the company is making preliminary arrangements, taking up a former survey, and getting ready to finance and build a line from El Reno, Okla., southwest to a point on the Kansas City, Mexico & Orient, either at Sentinel or at Dill City, about 100 miles. Construction work has not yet been started.

Fort Smith, Van Buren & Eastern.—Incorporated in Arkansas, with $100,000 capital, to build interurban lines from Van Buren, Ark., to various places in Crawford, Franklin, Johnson, Madison, Newton, Boone and Searcy counties. W. F. Keller, president, Van Buren; L. W. Burgett, vice-president; T. A. Bayley, secretary, and S. A. Perrot, treasurer.

Gary, Hobart & Valparaiso (Electric).—An officer writes that work is to be started as soon as weather conditions will permit on a line from Gary, Ind., southeast via Glenpark, New Chicago, Hobart and Wheeler to Valparaiso, about 25 miles. The work will include several small trestles and one concrete under-grade crossing. The company also plans to put up car barns and a powerhouse. J. S. Hopkins, president, 616 Corn Exchange bank, Chicago; B. A. Mapledoram, chief engineer, Hobart. (Jan. 14, p. 113.)

Grand Trunk.—An officer writes regarding the reports that plans are under consideration for a line from Grand Rapids, Mich., south to Kalamazoo, about 50 miles, that at the present time the company does not contemplate building the line. (Jan. 7, p. 68.)

Great Northern.—An officer writes that contracts have been let to J. W. Stewart for grading the Vancouver, Victoria & Eastern from Princeton, B. C., west to Tulameen, 17 miles; also from Abbottsford east to Chilliwack, 20 miles. (Jan. 7, p. 68.)

Surveys are said to be under way for an extension of the Okanogan Valley branch, from Oroville, Wash., north to Penticon, B. C., at the foot of Okanogan lake.

According to press reports this company is planning to build a branch from Great Falls, Mont., west to Augusta, in the northern part of Lewis and Clark counties, about 70 miles. Surveys said to be made.

Announcement has been made that the Board of Railway Commissioners of Canada has authorized the opening for traffic of the section of the Vancouver, Victoria & Eastern from Keremeos, B. C., to Princeton, 41.6 miles.

Hammond, Chicago Heights & Southern Traction.—Incorporated in Illinois, with $500,000 capital, to build from a point near Hammond, Ind., southwest to Chicago Heights, Ill., thence south to St. Anne, in Kankakee county, in all about 50 miles. The incorporators include: W. S. Reed, J. Orr, A. Ward and E. R. Davis, Chicago, and A. Van Steenburg, Lansing, Mich.

Idaho Roads.—According to reports from St. Maries, Idaho, the Blackwell Lumber Co. has finished grading an eight-mile logging line from the St. Maries-Bovill branch of the Chicago, Milwaukee & Puget Sound east to timber properties of the company near Fernwood. It is expected to have track laid this month on the main line to Fernwood. As soon as this work is finished track-laying will be started on a line to Blackwell.

Imperial Valley.—This company, operating a 10-mile line in Texas, is said to have plans ready to begin work soon on an extension along the east side of the Brazos river.

Iowa & Southwestern.—An officer writes that contracts will be let some time this spring for a line to be built from Clarinda, Iowa, southwest via College Springs to Blanchard, in Page county, 20 miles. W. S. Farquhar, president, College Springs, and J. E. Judd, chief engineer, Clarinda. (Dec. 10, p 1167.)

Lancaster & Northern.—Work is said to have been started on a line from Lancaster, Pa., north to Millway, 12½ miles. Riley Williams, president, 165 Broadway, New York.

Mexican Roads.—A syndicate, of which Paul de Vilaine is the representative at Guadalajara, Mex., is said to have been formed to build the Guadalajara-Chamela Railway, on which work is to be begun early this year. The proposed route is from Chamela, Jalisco, on the Pacific coast of Mexico, northeast to La Vega, 43 miles from Guadalajara, about 200 miles, with a branch to Ayutla, 16 miles. The company plans to operate trains over the tracks of the Ameca line of the National Railways of Mexico to Guadalajara.

Oregon Trunk Line.—The general land office at Portland, Ore., has denied a motion for review of the decision awarding the Oregon Trunk Line, a Hill project, exclusive right-of-way on one side of the Des Chutes canyon for a little over 12 miles in Oregon. This is expected to end the litigation between the Hill and Harriman companies, and settles the ownership of the last mile of the section between the Columbia river and the upper end of the canyon, where these rival lines branch apart. The Harriman line is being built under the name of the Des Chutes Railroad. (Oct. 15, p. 727.)

Pittsburgh & Lake Erie.—See an item in regard to this company under Traffic News.

Raleigh & Southport.—According to press reports an extension is to be built from Fayetteville, N. C., southeast to Elizabethtown, Bladen county, about 50 miles.

St. Louis County Belt.—An officer writes that contracts will be let February 1 for grading 50 miles of this line. The

company was recently incorporated in Missouri to build a line in St. Louis county, Mo. E. Whitaker, president; R. McCully, vice-president; J. Houseman, general manager, and W. Nagel, chief engineer, 948 Pierce building, St. Louis. (Oct. 1, p. 614.)

SAN PEDRO, LOS ANGELES & SALT LAKE.—See item regarding this company under General News.

SOUTHERN PACIFIC OF MEXICO.—Work is said to have been started on a branch to connect the Southern Pacific's coal fields in the Barranca district of Sonora, Mex., with the Yaqui river extension at Tonichi.

The line being built from Guaymas, Mex., southeast along the Pacific coast towards Guadalajara has been opened as far as Acaponeta, in the territory of Tepic. The line is ready to be opened as far south as Rosamorada, about 605 miles from Guaymas, and train service, it is expected, will soon be extended to that point soon.

SOUTHWESTERN.—A contract is said to have been given to the Grigsby Construction Co. for work on 30 miles between Henrietta, Tex., and Archer City. It is expected to have this section of the line in operation by the middle of March. (Dec. 24, p. 1262.)

SUMPTER VALLEY.—Work is said to be under way on an extension from Austin, Ore., southwest to Prairie City, 22 miles. (July 9, p. 79.)

TACOMA EASTERN.—See Chicago, Milwaukee & Puget Sound.

TOLEDO, ST. LOUIS & NEW ORLEANS.—According to press reports this company is letting contracts for clearing a right-of-way through the counties of Gallatin, Hardin and Pope, in Illinois. It is expected that grading will be begun about April 1 on a section from Golconda northeast to a point in Gallatin county. N. M. Burns, president, 1622 Peirce building, St. Louis, Mo. (April 30, p. 961.)

UVALDE & LEONLA VALLEY INTERURBAN.—Work will be started soon, it is said, on a line from Uvalde, Tex., southeast to Batesville, about 30 miles. The line will be operated either by electricity or gasolene motor cars. Charles Peterson, president, Uvalde.

VERA CRUZ & ISTHMUS.—A 99-year concession is said to have been granted this company to build lines as follows: From Rives, Vera Cruz, Mex., north to San Andres Tuxtla; from a point on the main line to Cerro Colarado, Canton de Cosamaloapan, and from the same point to San Isidro, on the river Tonto. The company is allowed four years in which to import material free of charge, to be used in the construction of the lines. (Dec. 3, p. 1109.)

WEBBERS FALLS, SHAWNEE & WESTERN.—Organized to build from Webbers Falls, Okla., west to Warner, thence southwest to Shawnee, about 120 miles. The first section to be built will be from Warner to Webbers Falls, 12 miles. The work will include one bridge. The company is said to be asking prices on 60-lb. relaying rails, for delivery at Warner, April 1. The C. E. Hagerty Engineering & Construction Co., engineers. A. R. Peyinghaus, Muskogee, is an incorporator. (Dec. 17, p. 1214.)

WESTERN MARYLAND.—See an item in regard to this company under Traffic News.

WISCONSIN & NORTHERN.—Regarding the reports that this company has rejected bids for the construction of an extension from Shawano, Wis., south to Appleton and Neenah, and that the work has been indefinitely postponed, an officer is quoted as saying that there is no truth in this statement. The company is planning to carry out extension work during this year. Grading work was suspended during the winter months. Last year grading was finished on five miles from Van Ostrand, Wis., the present northern end of the Shawano district, northward to the crossing of the Wolf river. This is on the section between Van Ostrand and Crandon, where there is a gap of 31 miles. On the Crandon end four miles are cleared and about 70 per cent. of the grading finished, leaving about 22 miles upon which grading has been started. The remainder of the excavation on this gap and the section from Shawano to Neenah will be comparatively light work. (Jan. 14, p. 114.)

Railway Financial News.

CUBA RAILROAD.—A dividend of 1½ per cent. has been declared, payable February 1, on the $10,000,000 6 per cent. non-cumulative preferred stock. The only previous dividend was 1½ per cent. paid in August, 1909.

GROVETON, LUFKIN & NORTHERN.—The company has asked the Texas Railroad Commission for authority to register $437,000 bonds and $50,000 stock to be issued on the completed 21 miles of track between Groveton, Tex., and Vair. The road has been completed from Groveton to Lufkin, 36 miles.

LAKE SHORE & MICHIGAN SOUTHERN.—See Pittsburgh & Lake Erie.

LEHIGH VALLEY.—W. H. Moore, D. G. Reid and E. S. Moore have been elected directors, succeeding I. A. Stearns, R. C. Lippincott and G. H. McFadden.

LOUISVILLE RAILWAY.—See an item in regard to this company under Railway Construction.

MISSOURI PACIFIC.—Stockholders on January 18 voted to ratify the making of a refunding mortgage securing $175,000,000 5 per cent. convertible bonds, of which $29,806,000 were underwritten by Kuhn, Loeb & Co., New York, and offered to stockholders at 95. (Nov. 19, p. 993.)

NEW MEXICO CENTRAL.—A press despatch says that C. C. Murphy, treasurer, has been appointed receiver.

NEW YORK CENTRAL & HUDSON RIVER.—See an item in regard to this company under Traffic News.

NORTHERN PACIFIC.—W. S. Tod has been elected a director, succeeding J. R. Kennedy, deceased.

OREGON SHORT LINE.—Otto H. Kahn, Mortimer L. Schiff and William G. Rockefeller were elected directors and members of the executive committee.

PITTSBURGH & LAKE ERIE.—The directors have declared a semi-annual dividend of 5 per cent. and an extra dividend of 40 per cent., payable February 1. The stockholders are offered the privilege of subscribing at par to the extent of 40 per cent. of their holdings for $6,000,000 new stock. Of the $14,999,850 stock outstanding the Lake Shore & Michigan Southern owns $7,500,150.

See an item in regard to this company under Traffic News.

ROCK ISLAND CO.—The *Commercial and Financial Chronicle* says that F. S. Pearson and associates, who control the Mexico & North Western, have bought, it is understood, a large block of the preferred stock of the Rock Island Co. and will work in harmony with the Moore interests, who control the company.

ST. LOUIS & SAN FRANCISCO.—See St. Louis, Brownsville & Mexico.

ST. LOUIS, BROWNSVILLE & MEXICO.—A stockholders' meeting has been called for March 10 to authorize a new mortgage to secure $25,000,000 bonds and to cancel all but $500,000 of the outstanding stock and substitute bonds therefor. On June 30, 1908, of the authorized $3,850,000 stock, $1,221,500 was outstanding. The St. Louis & San Francisco recently took over nearly all of the outstanding stock, most of which had previously been acquired by B. F. Yoakum and associates.

SOUTHERN PACIFIC.—Mortimer L. Schiff has been elected a director and member of the executive committee, succeeding his father, Jacob H. Schiff, resigned.

UNION PACIFIC.—Otto H. Kahn, of Kuhn, Loeb & Co., has been elected a director and a member of the executive committee of the Union Pacific, succeeding Jacob H. Schiff, resigned.

WABASH.—See an item in regard to this company under Court News.

WESTERN MARYLAND.—See an item in regard to this company under Traffic News.

Supply Trade Section.

The Pressed Steel Car Co., Pittsburgh, Pa., has acquired the interest in the Western Steel Car & Foundry Co., formerly held by A. C. McCord & Co., Chicago.

The Merchants Despatch Transportation Co., New York, has let the contract for a new shop at East Rochester, N. Y., for the fabrication of steel underframes for the company's cars.

The Lynch Railway Automatic Brake Co., Kansas City, Mo., has been incorporated in Missouri with a capital of $100,000. The incorporators are James Lynch, G. A. Dehaven and W. H. England.

Geo. A. Post, Jr., has been elected a director of the Standard Coupler Co., New York, to succeed J. E. French, who is also chairman of the board of directors of the Railway Steel Spring Co., New York.

The Modoc Co., Philadelphia, Pa., has opened an office at 109 Chestnut street. Several additional pieces of machinery have been installed at its factory in Fernwood, Pa., which machinery is for the manufacture of car cleaner and soap powder.

The W. N. Best American Calorific Co., New York, has retired from business, and the oil and tar burners, regulating cocks and various types of furnaces formerly handled by this company are now being manufactured and sold by W. N. Best, the inventor, with office at 11 Broadway, New York.

The Commercial Acetylene Co., 80 Broadway, New York City, has received an order for 250 acetylene headlights for locomotives of the Illinois Central, the Yazoo & Mississippi Valley, the Indianapolis Southern and the Central of Georgia. The Boston & Maine has ordered acetylene equipment for 1,000 headlights.

The Blue Island Rolling Mill & Car Co., Chicago, mentioned in the *Railway Age Gazette* of December 31, advises that the company is a consolidation of the Blue Island Car & Equipment Co. and the F. H. Niles Car Co. Four new buildings, two mills, a forge shop and a machine shop, are being built at the plant in Blue Island, Ill.

The National Railway Devices Co., Chicago, advises that its Duplex uncoupler and automatic release is to be used on 100 Clark cars and 150 Pressed Steel Car Company cars for the Duluth, Missabe & Northern, and also on 150 Pressed Steel Car Company cars for the Duluth & Iron Range. These orders were reported in the *Railway Age Gazette* of January 7.

J. E. Osmer has been appointed assistant superintendent of the Hicks Locomotive and Car Works, Chicago Heights, Ill., in charge of the locomotive works. Mr. Osmer has been connected with the mechanical departments of the Iowa Central, the Chicago & Alton, the Chicago & North Western and the Northwestern Elevated, serving as master mechanic of the latter company for the last six years.

Walter D. LaParle has been appointed sales manager of the Chicago Bearing Metal Co., Old Colony building, Chicago. Mr. LaParle has been in the railway supply business for 20 years and has a wide acquaintance among railway officers in the operating and mechanical departments. For 11 years he was connected with the Verona Tool Works, Pittsburgh, Pa., and later organized the Solid Steel Tool Co., now the Western Tool & Forge Co., Brackenridge, Pa.

The Geo. E. Molleson Co. has been incorporated under the laws of the state of New York for the purpose of buying and selling iron and steel products and railway supplies. The officers of the company are: Geo. E. Molleson, president and treasurer; L. M. Shook, secretary. The New York office will be continued at 50 Church street and the Chicago office will be in the Railway Exchange building. Mr. Molleson has been railroad representative for the Tyler Tube & Pipe Company, Pittsburgh, Pa., for the past 17 years, and the Geo. E. Molleson Co. will continue to represent this company, Mr. Molleson giving the business his personal attention.

At the recent first annual stockholders' meeting of the International Steel Tie Co., Altoona, Pa., it was decided to place on the market $50,000 worth of stock to establish the necessary manufacturing facilities for filling orders at present on hand. The assembly factory at Johnstown, Pa., is well under way and will be pushed to completion as rapidly as possible. The buildings will cover about half an acre of ground. The location of the site for the fastener factory has not yet been settled, and for the present the fasteners will be purchased from a firm in Cleveland, Ohio. The following are the present officers of the company: B. A. Oswald, president; George Harpham, secretary; S. M. Hoyer, treasurer, and W. P. Day, manager.

The Slack Manufacturing Company, Springfield, Vt., is making an abrasive metal cutter which is specially adapted to cutting tool steel. It consists of an emery wheel 12 in. in diameter and $\frac{3}{32}$ in. thick. These wheels run at a speed of 4,000 r.p.m. The maximum capacity is 2-in. round or 2-in. square stock. It is claimed that these wheels will cut with ease and despatch high-speed carbon or cold rolled steel, brass, bronze and other metals, either round, flat, square or tubing; that ½-in. square tool steel is cut in 10 seconds and ½-in. steel tubing is cut in two seconds. The wheel is of special advantage in cutting thin or flexible tubing and the surface, after the cut, is perfectly clean and true with no burs, irregularities or uncertainties as to length, as the cut is gaged to a nicety.

Frank P. Smith, mention of whose acceptance of a position with the Hobart-Allfree Co., Chicago, was made in these columns last week, entered railway service in the early seventies as a locomotive fireman on the Milwaukee & St. Paul. He afterwards served in the same capacity on the Toledo, Wabash & Western and the Chicago & North Western, on which latter road he was promoted to engineer. In this capacity he served successively on the Wabash; the St. Louis & Iron Mountain; the Chesapeake & Ohio; the Kentucky Central; the New York, Chicago & St. Louis; the Louisville, New Orleans & Texas, and the Cincinnati Southern. In the early nineties he entered the railway supply business with the C. C. Jerome Metallic Packing Co., and in November, 1895, he entered the service of the Hancock Inspirator Co., which company was in 1900 absorbed by Manning, Maxwell & Moore, New York. He remained in this position until December 31, 1909, at which time he entered the service of the Hobart-Allfree Co., with headquarters at New York City, as previously reported.

Frank Raymond Coates, who on December 1 was elected vice-president of the Inter Ocean Steel Company, Chicago, was born June 20, 1869, at Philadelphia, Pa. He graduated from Lehigh University at Bethlehem, Pa., in 1890, and took a post graduate course at the same school in 1891. He entered railway service on July 1, 1891, as a transitman on the Pittsburgh division of the Baltimore & Ohio. From February, 1892, to January, 1893, he was supervisor on the Wheeling division of the same road. From May, 1893, to December, 1895, he was assistant roadmaster on the New York division of the New York, New Haven & Hartford. In 1893 he devised the scheme of putting the nuts on angle bars alternately in and out, which is now used by the majority of the railways of this country. From December, 1895, to October, 1899, he was roadmaster on the same division of the New Haven. He had direct charge of four-track construction work on the New Haven. From 1900 to 1904 he was chief engineer of the Chicago Great Western and vice-president of the Weber Railway Joint Company. While with the Great Western he rebuilt a great deal of its line. Since 1904 he has been associated with the Stone & Webster Engineering Company, Boston, Mass., and has been engaged in construction and engineering work in the west. He has taken a prominent part in standardizing tools and materials for railway maintenance work and also has been interested in hydro-electric and irrigation engineering. For five years he has been a member of

the entertainment committee of the American Railway Engineering and Maintenance of Way Association. He is a member of the following clubs and associations: Chicago Club, Chicago Athletic Association, Chicago Engineers' Club, Engineers' Club of New York, American Society of Civil Engineers, American Railway Engineering and Maintenance of Way Association, American Street and Interurban Railway Association, Western Society of Engineers, New York Railroad Club and Western Railway Club.

Quinn Refrigerator Patent Sustained.

The United States Circuit Court of Appeals, Third district, Judges Gray, Buffington and Lanning, has affirmed the decree of the Circuit Court for the district of New Jersey, sustaining the validity of the Quinn patent, No. 539,009, on refrigerators, thus deciding in favor of the Seeger Refrigerator Company its suit against the American Car & Foundry Company for infringement. The car company had used refrigerators bought from the White Enamel Refrigerator Company, made under Ames' patents, and the decision is to the effect that Ames infringes Quinn's patents in claims 1, 3 and 7. On appeal the car company contended that the Quinn patent was invalid and that there was not proof of infringement. On the merits of the Quinn patent the court says: "Quinn was the first to put between the ice bunker and the refrigerating room of a refrigerator a partition composed of a series of inverted V-shaped sections so arranged that the open spaces, to use the language of the patent, 'form, as it were, air siphons leading from the refrigerating room into the ice bunker.' It is this series of open air spaces, somewhat resembling siphons, placed between the ice bunker and the refrigerating room, that distinguishes Quinn's patent from all the earlier patents. With the exits of these so-called siphons opening downward to allow the free escape of the air into the vacuum created by the descending currents in the ice bunker, and their mouths opening downward to facilitate the induction into them of the ascending currents of warmer air in the refrigerating room, circulation is promoted in a manner quite new." Player's arrangement of inclined slats does not anticipate Quinn's invention, nor do any of the other prior devices. Ames makes inverted V arrangements similar to Quinn's, and has one of the legs longer than the other. Possibly this is an improvement on Quinn, but that does not justify Ames in appropriating the essence of Quinn's invention. The court held that the car company had not shown by the necessary preponderance of evidence the defense of estoppel claimed. The car company had not relied on or been misled by any act or statement of the complaining manufacturers or of any of their officers.

TRADE PUBLICATIONS.

Rice Lands.—This is the title of a booklet on the Arkansas and Louisiana rice fields issued by the Missouri Pacific-Iron Mountain system. Numerous views of the growing rice and its harvest are used as illustrations of the descriptive matter.

Telephony in Railway Service.—The Western Electric Co., New York, has just issued a number of folders on this subject, one of which describes the use of telephones for railway terminal use, another the Western Electric portable telephones, another the portable composite telephone set, and the fourth the Gill selector as used in connection with the telephone for train despatching.

California.—The Chicago, Milwaukee & St. Paul has published a 16-page booklet entitled "California—Winter's Summer Garden." Each page contains one or more halftones and some description set on a background of lightly tinted scenes of life in California. The covers bear a similarly tinted view of a touring car party passing an old monastery as a background for a copy of a painting of an automobile girl.

Milling Machines.—The Cincinnati Milling Machine Co., Cincinnati, Ohio, has issued a new edition of its catalogue illustrating milling machines and cutter grinders, including a complete line of milling machines, both cone and high power single-pulley type. The latter are made in two styles, plain and universal, horizontal and vertical. The catalogue shows the important improvements which have been made in the No. 1½, 2 and 3 cone-driven machines, especially in the column and feed mechanism. The column is similar to that used on high-power machines in that it is a complete box in form and contains the entire feed mechanism. The high-power single-pulley machines are designed for taking heavy cuts on which fast feeds are permissible. The catalogue contains examples of rapid milling, indicating the great productive capacity of these machines. It also contains a large number of milling machine attachments which are supplied by this company. All these machines are well illustrated and the description and data are unusually complete. The catalogue contains also notes on the erection and care of milling machines and complete speed tables for all the different sizes.

1910 Calendar.—The Bettendorf Axle Co., Davenport, Iowa, has issued a calendar for 1910 in which each month is displayed on a separate card 14 in. x 19 in. in size, the upper half of which bears a large picture. The January illustration is a relief map of the United States, on which is cast the shadow of the Bettendorf one-piece truck frame. The caption is "Coming events cast their shadows before." The February card carries a moonlight view of the Davenport plant with the Mississippi river in the background. June suggests the annual conventions at Atlantic City and the illustration shows a young woman interested in Bettendorf products starting to the convention. August is a month of vacations, and on the card for that month the Bettendorf bears, which have figured in previous advertising for the company, are shown enjoying a rest. December closes the year with a representation of blind justice weighing the one-piece frame against the arch bar frame and pronouncing the fate of the latter in the biblical quotation "weighed in the balance and found wanting." The cards for other months have illustrations of interior views of the Davenport plant. The entire calendar is suspended from a miniature gilded aluminum truck frame.

RAILWAY STRUCTURES.

ALVIN, TEX.—The Gulf, Colorado & Santa Fe has begun work on a brick and concrete passenger station. The building will be 100 ft. long and 40 ft. wide.

BOYLES, ALA.—According to press reports the Louisville & Nashville has appropriated $654,000 for new shops at Boyles. Work is to be started within a few weeks.

CHARLEMONT, MASS.—See Boston & Maine under Railway Construction.

CLEVELAND, OHIO.—According to a schedule filed by the Lake Shore & Michigan Southern with the New York State Public Service Commission, a freight station on Wason street is to be built during the year at a cost of $96,000. This is in addition to the passenger and freight station on 105th street mentioned in the *Railway Age Gazette* of November 26. The schedule also includes a double-track arch over the Grand river at Painesville, Ohio; a new bridge at Nottingham, Ohio, and numerous improvements to the shops at Collinwood, Ohio.

COLLINWOOD, OHIO.—See Cleveland, Ohio.

DENVER, COLO.—The Chicago, Burlington & Quincy has bought a block of land bounded by Nineteenth and Twentieth, Wewatta and New Haven streets. This site is near the present union station and it is reported that plans for a freight and transfer station for the joint use of the Chicago, Burlington & Quincy and the Colorado & Southern are being prepared.

DES CHUTES, ORE.—The Oregon Trunk has a bill before the Washington legislature asking permission to build a bridge over the Columbia river and the Celilo canal, near the mouth of the Des Chutes river. Plans are said to be made for a structure to cost $1,500,000, to connect the Oregon Trunk, under construction into central Oregon, with the Spokane, Portland & Seattle.

EVANSTON, WYO.—The Union Pacific is to build a roundhouse and shops this spring.

GLOUCESTER, MASS.—See Boston & Maine under Railway Construction.

HARRISBURG, PA.—A vote will be taken to decide whether the

city's debt shall be increased to provide funds for improvements. The work includes a new viaduct over the Pennsylvania Railroad at Walnut street, to cost $300,000; also a new bridge over the Philadelphia & Reading at Thirteenth street, to cost $25,000.

KEENE, N. H.—See Boston & Maine under Railway Construction.

KENT, OHIO.—The Erie, it is said, will enlarge its shops at a cost of $150,000.

LEWISTON, ME.—The Grand Trunk is said to be at work putting up five bridges on the branch between Lewiston and Lewiston junction; two of these, in the Grand Trunk yard, are finished, also the one over the Androscoggin river. There remains one bridge to be built over Taylor brook, and another at Littlefield crossing. It is understood that the old passenger station and freight house at Lewiston is to be replaced by a modern structure.

MARSHALL, TEX.—In addition to the passenger station and shops previously mentioned in the *Railway Age Gazette*, the Marshall & East Texas expects to build a coal chute and steel turntable.

MERIDIAN, CAL.—According to press reports a bridge is to be built over the Sacramento river at Meridian. The estimated cost is $120,000. The Northern Electric Railway is to pay one-half of this amount. Surveys are being made by the railway company for an extension from Yuba City, in Sutter county, west via Sutter City and Meridian to Colusa, about 24 miles.

NOTTINGHAM, OHIO.—See Cleveland, Ohio.

OMAHA, NEB.—The Chicago & North Western is to build an addition to its freight house facing on Thirteenth street. When the present building was planned allowance was made for this addition, and actual construction was only delayed until the demand for more room should warrant the expenditure.

PAINESVILLE, OHIO.—See Cleveland, Ohio.

SALEM, MASS.—See Boston & Maine under Railway Construction.

SHELBURNE FALLS, MASS.—See Boston & Maine under Railway Construction.

TERRELL, TEX.—The Texas Midland is building car and locomotive shops in which the power will be furnished by a producer plant and gas engine.

WASHINGTON, D. C.—The Senate committee has reported favorably a bill appropriating $5,000,000 for the construction of a memorial bridge over the Potomac river, between Potomac park and Arlington National cemetery.

YARDLEY, PA.—The Philadelphia & Reading, it is understood, will build a four-track bridge over the Delaware river at Yardley.

FOREIGN RAILWAY NOTES.

Contracts are to be closed at an early date for building a line from Setubal, Portugal, to Garvao.

A plan for double-tracking the railway from Forli, Italy, to Rimini, has been approved by the Italian State Railways. The cost is estimated to be $540,000.

According to a German consular report the Kobe-Akashi Electric Railway Company, with a capital of $1,050,000, has been formed to build an electric railway from Kobe, Japan, to Askashi. The first five miles of the road is to be double track.

The number of travelers using the Swiss postal coaches over the Simplon Pass was 1,216 in 1907 and 1,428 in 1908; using the Furka Pass, 14,257 in 1907 and 14,693 in 1908; using the Grimsel Pass, 5,622 in 1907 and 5,548 in 1908. This shows that despite the increasing number of railways in Switzerland more people took the coach journeys over the Simplon and Furka passes in 1908 than in 1907.

Late News.

The items in this column were received after the classified departments were closed.

According to press reports, the Atlantic Coast Line will build a bridge over the Roanoke river at Weldon, N. C.

G. M. C. Brown has been appointed European manager of the Canadian Pacific, succeeding Archer Baker, who died on January 16.

The Cincinnati, Hamilton & Dayton announces that it will spend $1,500,000 at Toledo on an ore handling plant, new freight yards and extensive new docks.

L. D. Smith, assistant to president of the Lehigh Valley at New York, has been elected vice-president, in charge of the financial and accounting departments. He will have officers at both New York and at Philadelphia.

John A. Bensel, chairman of the Board of Water Supply of New York, has been elected president of the American Society of Civil Engineers. The other officers elected were J. T. Fanning and Hunter McDonald, vice-presidents; J. M. Knapp, treasurer.

J. W. Robins, vice-president and general superintendent of the Chicago, Rock Island & Gulf and general superintendent of the Southern district of the Chicago, Rock Island & Pacific, at Fort Worth, Tex., has been elected president of the Trinity & Brazos Valley, succeeding R. H. Baker, resigned.

The Committee on Interstate and Foreign Commerce, of the lower House of Congress, of which Representative Mann of Illinois is chairman, will soon hold hearings on the railway bills. The railways will be called on to present their side of the question on Thursday, Friday and Saturday of next week.

The Southern Railway has made arrangements to pay the $15,000,000 three-year, 5 per cent. debenture notes maturing February 1, 1910. Of the amount $5,000,000 will be paid from cash on hand and $10,000,000 will be paid from the proceeds of the sale to J. P. Morgan of $10,000,000 5 per cent. notes of 1910-1913.

At a meeting of the Traffic Club of New York, to be held at the Hotel Astor, on January 25th, Joseph French Johnson, D. C. S., dean of New York University School of Commerce, Accounts and Finance, and W. H. Lough, Jr., A. M., secretary and assistant professor of finance and transportation of New York University, will deliver addresses on "Prices, Rates and Wages."

A press dispatch dated Washington says that the Interstate Commerce Commission has received word that the new car demurrage rules, as recommended by the National Association of Railway Commissioners, will with slight modifications on a few roads, go into effect on April 1 on all railways in the southern territory, that is on all south of the Mason & Dixon's line and east of the Mississippi river. This is the result of a meeting held at Atlanta, January 11, at which all the bureaus were represented.

The Atlantic Coast Line has ordered 200 thirty-ton steel underframe flat cars and 100 forty-ton high-side gondola cars from the Standard Steel Car Co. These cars were not ordered from the Barney & Smith Car Co., as reported in the *Railway Age Gazette* of November 26. The flat cars will weigh 2,700 lbs. and will be 40 ft. long, 9 ft. wide and 4 ft. 1 in. high, over-all measurements. The underframes will be of steel. The high-side gondola cars, which will be used for special logging service, will weigh 3,800 lbs., and will be 37 ft., 3½ in. long, 9 ft. wide and 7 ft. high, inside measurements, and 40 ft. long, 10 ft. 5½ in. wide and 11 ft. 1⅞ in. high, over-all measurements. The bodies will be of wood with steel framing and the underframes will be of steel. The special equipment will be as follows:

Brakes	Westinghouse
Brake-beams	Pennsylvania deck
Brasses	A. C. L. standard
Draft gear	Farlow-Westinghouse
Dust guards	Harrison
Journal boxes	Symington
Side bearings	A. C. L. specifications
Springs	A. C. L. standard
Trucks	A. C. L. standard arch bar

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Hocking Valley is in the market for 23 locomotives.

The Oliver Iron Mining Co., Duluth, Minn., is said to be in the market for 10 locomotives. This item is not confirmed.

CAR BUILDING.

The Grand Trunk has ordered 200 refrigerator cars from the Canada Car Co.

The Denver City Tramway, Denver, Colo., is reported to be figuring on 35 electric cars for 1910.

The Public Service Ry., Newark, N. J., has ordered 100 pay-as-you-enter cars from the Cincinnati Car Co.

The Chesapeake & Ohio is asking prices on from 200 to 600 gondolas, 200 to 600 flat cars and 200 to 600 box cars.

The Hudson & Manhattan has ordered 50 all-steel passenger cars for tunnel service from the American Car & Foundry Co.

The Pere Marquette advises that the company is not considering ordering 1,000 to 2,000 gondolas as reported January 7.

The Harriman Lines, reported in the *Railway Age Gazette* of January 14 as negotiating with the Pullman Co. for 2,000 refrigerator cars, has placed an order for this equipment with this company.

The Barrett Mfg. Co., Chicago, has ordered from the American Car & Foundry Co. 75 tank cars for February delivery. The cars will be all-steel, of 10,000 gallons capacity, mounted on 100,000-lb. capacity trucks.

The New York, Chicago & St. Louis, reported in the *Railway Age Gazette* of January 7 as being in the market for box and gondola cars, has ordered 1,000 all-wood, 30-ton box cars from the Haskell & Barker Car Co., and 1,000 all-wood 40-ton gondola cars from the Hicks Locomotive & Car Works.

The Cincinnati, Hamilton & Dayton, reported in the *Railway Age Gazette* of January 7 as being in the market for 1,000 Ingoldsby dump cars, has ordered 1,500 steel gondolas, divided equally between the Pressed Steel Car Co., the Cambria Steel Company and the Ralston Steel Car Co. This company has also ordered 1,000 steel underframe box cars from the American Car & Foundry Co.

MACHINERY AND TOOLS.

See an item under General News regarding a power plant for the United Railway Co. of St. Louis, Mo., and other roads.

The Sapulpa Steel & Iron Mills has recently ordered from the Allis-Chalmers Co., Milwaukee, Wis., a 28-in. x 48-in. non-condensing, heavy duty, rolling mill engine.

The Texas Midland will require some auxiliary gas producer plant machinery, although the producer and engine mentioned under Railway Structures have already been purchased.

The Portland Railway, Light & Power Co., Portland, Ore., is increasing the capacity of its hydro-electric plant. It has recently ordered from the Allis-Chalmers Co., Milwaukee, Wis., a 3,750-k.w., 11,000-volt, 60-cycle, 3-phase, 360-r.p.m. alternator of the water wheel type. This will be semi-enclosed and of the same general design as the two generators already supplied by this company. A 50-k.w., 120-volt, exciter is to be direct-connected to an extension of the alternator shaft.

IRON AND STEEL.

The Chicago City Railway is in the market for 5,000 tons of girder rails.

The Missouri Pacific is in the market for 4,000 tons of bridge steel.

The Pennsylvania is in the market for 200 tons of bridge steel for maintenance work.

The Merchants Despatch Transportation Co., New York, has ordered from the Lackawanna Bridge Co., Lackawanna, N. Y., 250 tons of structural steel for shops, as mentioned under Supply Trade News.

General Conditions in Steel.—Press reports from Chicago indicate that there is at present a greater activity in the steel business than at any time since the height of the activity in 1907. This same report states that one fabricated steel maker refused a 2,000-ton order due to the overcrowded condition of his plant. The production of bessemer and open hearth ingots by the U. S. Steel Corporation in 1909 amounted to more than 13,000,000 tons. Pittsburgh reports state that the pig-iron output of Pennsylvania and the central west will, during the next 30 days, be increased about 80,000 tons per month by the blowing in six additional furnaces. From present indications, this year will establish new high records in the output of all classes of iron and steel.

SIGNALING.

The Baltimore & Ohio will begin work at once on the new automatic block signals to be put in from Connellsville to Pittsburgh, and from Laughlin Junction to New Castle, Pa., a distance of 112.6 miles. Six miles of this, between Bessemer and Wheeling Junction, will be four-track.

Ward Ideal Heating System.

The Ward Equipment Co., New York, is offering a new system for heating railway cars. It is claimed that this system will maintain any desired temperature in the car, regardless of outside weather conditions. The system is certainly one which embodies some very interesting and notable features, one of the most important of which is Ward's Unotherm, shown in Fig 1. An elevation of the car piping, Fig. 2, with

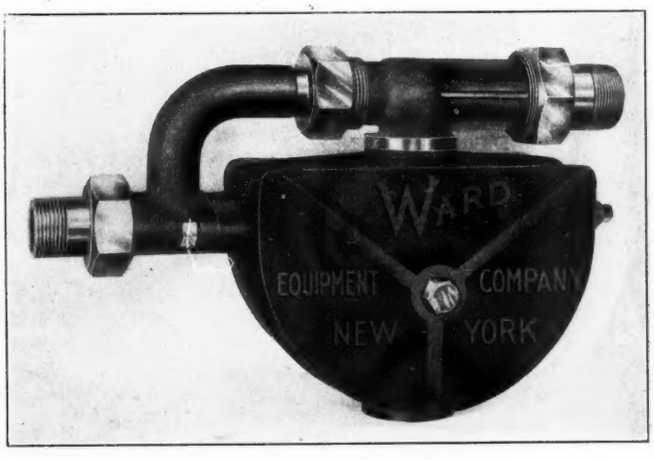


Fig. 1—Ward's Unotherm.

section through the unotherm, shows the connections from the steam train line under the car to the unotherm and thence to the heat radiating pipes. The unotherm is located under a seat near the middle of the coach.

Steam from the train line is admitted to the system by the valve 99, Fig. 2, and passes in the direction of the arrows through the opening at 37 and the valve 42, thence through the pipe 38, the nozzle 45 and into the radiating pipes. In leaving the nozzle 45 and passing through ahe combining tube of the ejector at 46, a suction is developed, which is felt in the chamber E of the unotherm and the pipe D, drawing air through the overflow C and heated fluid from the return pipe B. This heated fluid mingles with the outside air and all is drawn up through the chamber E and combining tube 46 and is then again driven through the system. The action of the unotherm is therefore controlled very largely by the outside air mixed with the return fluid. When sufficiently heated, the thermostatic tube 29 expands and closes the valve 42, thus preventing further entrance of steam into the system.

One of the most attractive features of this system is in the fact that the thermostatic device is subject not only to the heat within the car, but is also affected by the temperature

of a mixture of outside air and heated fluid from the return pipes. The opening and closing of the valve to admit steam to the radiator pipes for maintaining uniform heat, must necessarily be governed by several factors. The temperature of the air inside the car, as well as that of the air outside, are the principal elements with which a perfect car heating system must contend. These two important considerations, together with all the other essential elements, are said to be fully covered by the Ward Company's new system. The valve will be open much more frequently in cold weather than in warm, and consequently a greater amount of steam will be used and a larger amount of heat radiated. As the heat radiates from the pipes within the car and the steam condenses, the resulting water is discharged through the outlet C, and the mixture of fluid from the return and the air from the outside of the car is carried up into the chamber E and thence into the radiating pipes of the system, as above noted. As a consequence of this, no steam escapes at the overflow where the water of condensation is discharged, because everything but the water is carried back into the system and used repeatedly until the full benefit of practically all the heat energy taken from the locomotive is utilized. This naturally means the greatest possible economy in steam consumption, and a big reduction in the demand ordinarily made on the locomotive for train heating should result. The fact that no steam escapes at the outlet also means that the paint and varnish on the sides of the car will not become streaked and destroyed. It is also a very desirable thing to dispense with the unsightly appearance of steam blowing through the outlets.

It is claimed that by the use of Ward's new system a continuous circulation of steam and air is established and a great many advantages result, among which are the following: Freezing is impossible; the escape of steam, particularly disagreeable and sometimes dangerous, in heating of trains is prevented; the heat contained in the steam supplied by the locomotive is conserved; the noise of water-hammer is prevented; an even temperature and one automatically regulated throughout the train is provided; bursting of pipes and leaky joints is impossible; the steam passes through the piping of the car with surprising rapidity, since it is permitted to enter the system at pressure and travel at a greater speed than usual, due to the action of the ejector, which is continually drawing on the return; very simple in design and a small number of pieces; no parts outside the car and no attention required by trainmen.

The Ward Company has equipped a number of cars with this new system, and the recent spell of cold weather has subjected it to a very severe test. Although the cars so equipped have been running in widely different sections of the country the results are said to have been uniformly successful.

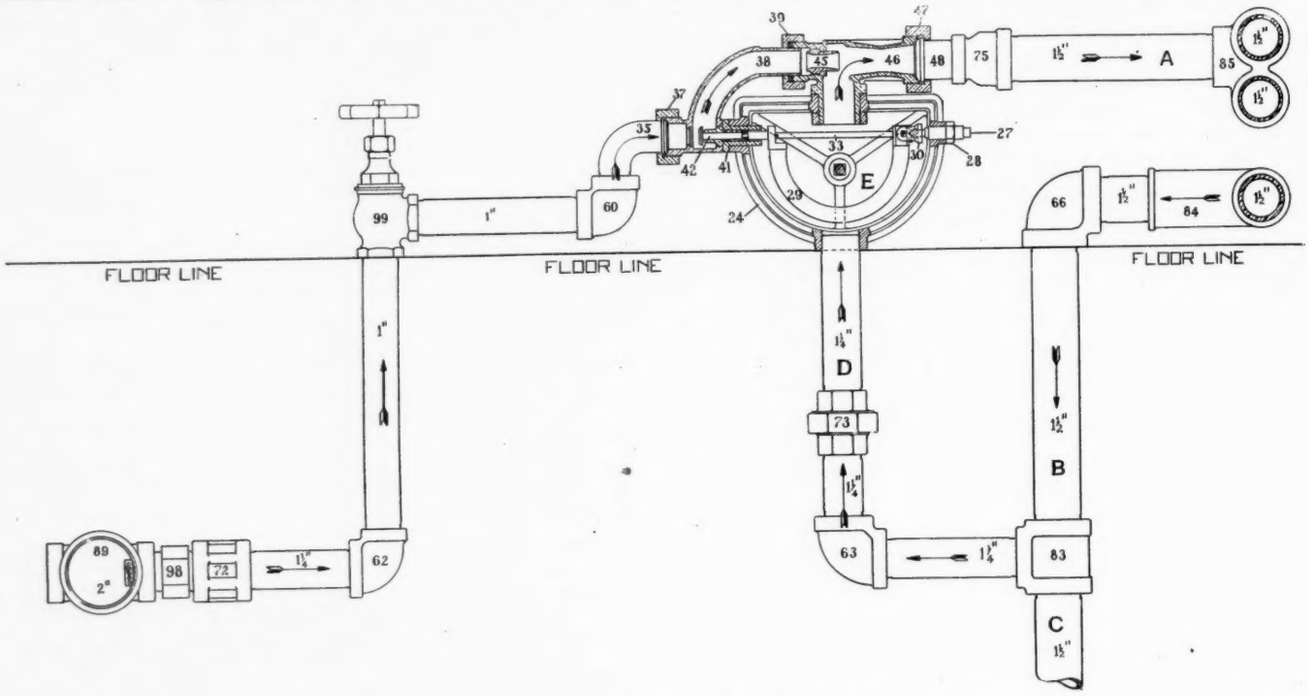


Fig. 2—Elevation of Car Piping, Showing Section Through Unotherm.

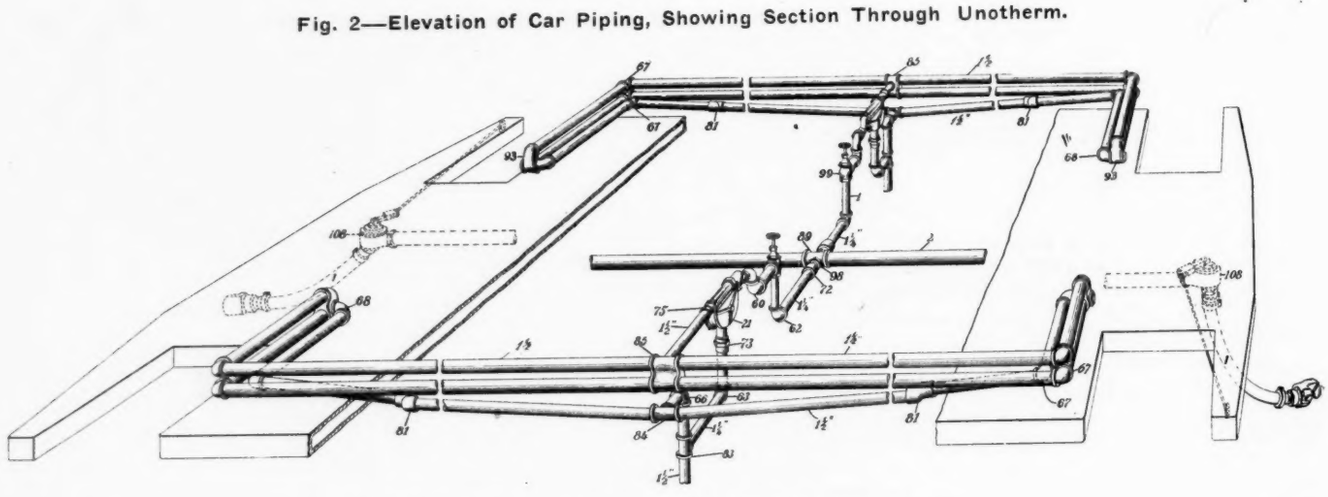


Fig. 3.—Plan of Piping for Ward Ideal Heating System.